User's Manual

10/100/1000Base-Tx to 1000Base-X Managed Media Converter

10/100/1000Base-Tx to 1000Base-X Managed Media Converter User's Manual

---

Release 1.00

Table of Contents

CAUTION ---------- VI
ELECTRONIC EMISSION NOTICES ---------- VI

CHAPTER 1. INTRODUCTION ---------- 2

1-1. OVERVIEW ---------- 2
1-2. FEATURES ---------- 2
1-3. CHECKLIST ---------- 3
1-4. VIEW OF THE CONVERTER ---------- 4
1-4-1. User Interfaces on the Front View (Button, LEDs and Plugs) ---------- 4
1-4-2. User Interfaces on the Rear Panel View ---------- 5

CHAPTER 2. INSTALLATION ---------- 6

2-1. NETWORK SYSTEM WIDE BASIC CONFIGURATION ---------- 6
2-2. STARTING RC-2201/02 UP ---------- 9
2-2-1. Battery Installation (For RC-2202 Only) ---------- 9
2-2-2. Cable and Hardware Installation ---------- 11
2-2-3. Management Station Installation ---------- 12
2-2-3-1. Installing Management Station through RC-2201/02 RS-232 Port ---------- 13
2-2-3-2. Installing Management Station through RC-2201/02 TP Port ---------- 14
2-2-3-3. Installing Management Station through RC-2201/02 Fiber Port via Central Site Converter Chassis ---------- 16
2-2-4. IP Address Assignment ---------- 17

CHAPTER 3. OPERATION OF WEB-BASED MANAGEMENT ---------- 22

3-1. WEB MANAGEMENT HOME OVERVIEW ---------- 23
3-2. THE FUNCTION TREE IN WEB MANAGEMENT ---------- 26
3-3. PORT STATUS AND COUNTER ---------- 28
3-4. CONFIGURATION ---------- 36
3-4-1. System Configuration ---------- 37
3-4-1-1. Username / Password Setting ---------- 37
3-4-1-2. IP Configuration ---------- 38
3-4-1-3. System Time Setting ---------- 40
3-4-1-4. Location/Contact Setting ---------- 43
3-4-1-5. TP Port Management ---------- 44
3-4-1-6. Power Down Setting ---------- 45
3-4-2. SNMP Configuration ---------- 46
3-4-3. Max. Packet Length Setting ---------- 49
3-4-4. Broadcasting Suppression ---------- 50
3-4-5. Misc. Feature Configuration ---------- 51
3-4-6. Spanning Tree Configuration ---------- 54
3-4-6-1. STP Status ---------- 54
3-4-6-2. STP Configuration ---------- 56
3-4-7. Filtering Configuration ---------- 60
3-4-8. VLAN Configuration ---------- 64
3-4-9. Trap/Alarm Configuration ---------- 66
3-4-10. Save Configuration ---------- 74

3-5. DIAGNOSTICS ---- 76
3-6. SHOW LOG DATA ---- 79
3-7. SOFTWARE UPGRADE ---- 85
3-8. REBOOT ---- 86
3-9. LOGOUT ---- 87

CHAPTER 4. OPERATION OF MENU-DRIVEN CONSOLE ---- 88

4-1. TEXT-BASED MENU-DRIVEN MANAGEMENT OVERVIEW ---- 89
4-2. THE FUNCTION TREE IN CONSOLE MANAGEMENT ---- 92
4-3. PORT STATUS AND COUNTER ---- 94
4-4. CONFIGURATION ---- 102
4-4-1. System Configuration ---- 103
4-4-1-1. Create Username / Password ---- 103
4-4-1-2. Change Username / Password ---- 104
4-4-1-3. IP Configuration ---- 105
4-4-1-4. System Time Setting ---- 107
4-4-1-5. Location/Contact Setting ---- 112
4-4-1-6. TP Port Management ---- 113
4-4-1-7. Power Down Setting ---- 114
4-4-2. SNMP Configuration ---- 115
4-4-3. Packet Length ---- 119
4-4-4. Broadcasting Suppression ---- 120
4-4-5. Spanning Tree Configuration ---- 121
4-4-5-1. STP Enable/Disable ---- 121
4-4-5-2. STP Status ---- 122
4-4-5-3. STP Configuration ---- 124
4-4-6. Misc. Feature Configuration ---- 128
4-4-7. Filtering Configuration ---- 132
4-4-8. VLAN Configuration ---- 138
4-4-9. Trap/Alarm Configuration ---- 140
4-4-10. Save Configuration ---- 148
4-5. DIAGNOSTICS ---- 150
4-6. SHOW LOG DATA ---- 153
4-7. SOFTWARE UPGRADE ---- 159
4-8. REBOOT ---- 160
4-9. LOGOUT ---- 161

CHAPTER 5. MAINTENANCE ---- 162

5-1. RESOLVING NO LINK CONDITIONS ---- 162
5-2. Q&A ---- 162

APPENDIX A TECHNICAL SPECIFICATIONS ---- 163

APPENDIX B NULL MODEM CABLE SPECIFICATIONS ---- 168

APPENDIX C MIB SPECIFICATIONS ---- 169

APPENDIX D SOFTWARE UPGRADE PROCEDURES ---- 208

Revision History

Release	Date	Revision
1.00	01/17/2007	A1

Caution

Circuit devices are sensitive to static electricity, which can damage their delicate electronics. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your device, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you pick up the circuit device.
- Pick up the device by holding it on the left and right edges only.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a class A computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

European Community (CE) Electromagnetic Compatibility Directive

This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN60555-2 and the Generic European Immunity Standard EN50082-1.

EMC:	EN55022(1988) /CISPR-22(1985)	class A
	EN60555-2(1995)	class A
	EN60555-3	
	IEC1000-4-2(1995)	4K V CD, 8KV, AD
	IEC1000-4-3(1995)	3V/m
	IEC1000-4-4(1995)	1KV – (power line), 0.5KV – (signal line)

About this user's manual

In this user's manual, it will not only tell you how to install and connect your network system but configure and monitor the RC-2201/02 through the built-in console and web by RS-232 serial interface and Ethernet ports step-by-step. Many explanation in detail of hardware and software functions are shown as well as the examples of the operation for web-based interface and text-based menu-driven console interface.

Overview of this user's manual

- Chapter 1 "Introduction" describes the features of RC-2201/02
- Chapter 2 "Installation"
- Chapter 3 "Operation of Web-based Management"
- Chapter 4 "Operation of Menu-driven Console"
- Chapter 5 "Maintenance"

Publication date: January, 2007
Revision A2

1. Introduction

1-1. Overview

The Converter is designed to make conversion between 10/100/1000Base-TX and 1000Base-LX/SX Fast Ethernet. With SNMP agent, web-based management and Telnet text-based manual driven management, the network administrator can logon the converter to monitor, configure and control the activity of each port. In addition, the converter implements bandwidth rating management capability via the intelligent software. The overall network management is enhanced, and the network efficiency is also improved to accommodate and deliver high bandwidth applications.

1-2. Features

The RC-2201/02 converter provides the following features for users to perform system network administration.

Management

- Port Status, Counter and Configuration.
- Display the basic System Information on user interface.
- System configuration which includes administrator, guest users and IP address relative to parameters and SNMP basic parameters.
- Maximal packet length can be up to 1536 bytes.
- Broadcasts suppress to avoid for power lost and recovery while a bunch of converter boxes sending broadcast for DHCP request simultaneously.
- The trap events alarm can be sent via e-mail and mobile phone short message. It includes Case Intrusion Detection.
- A configured setting can be saved into the on-board flash memory. And the current setting can be recovered from the default setting or the previous configured setting.
- On-board diagnostics function can let administrator know the hardware status.
- On-board firmware can be updated via TFTP function.
- The converter allows administrator to reboot system from management station.
- The converter will log the last 120 records in the main memory and display on the local console.

Publication date: January, 2007
Revision A2

1-3. Checklist

Before you start installing the converter, please verify that the package contains the following:

- A set of SNMP-enabled Managed Media Converter
- AC-DC Power Adapter
- RS-232 Cable
- Plastic Pads
- Battery for RC-2202 only
- This User's Manual

Please notify your sales representative immediately if any of the aforementioned items is missing or damaged.

Publication date: January, 2007
Revision A2

1-4. View of the Converter

Fig. 1-1 Full View of the Managed Media Converter

1-4-1. User Interfaces on the Front View (Button, LEDs and Plugs)

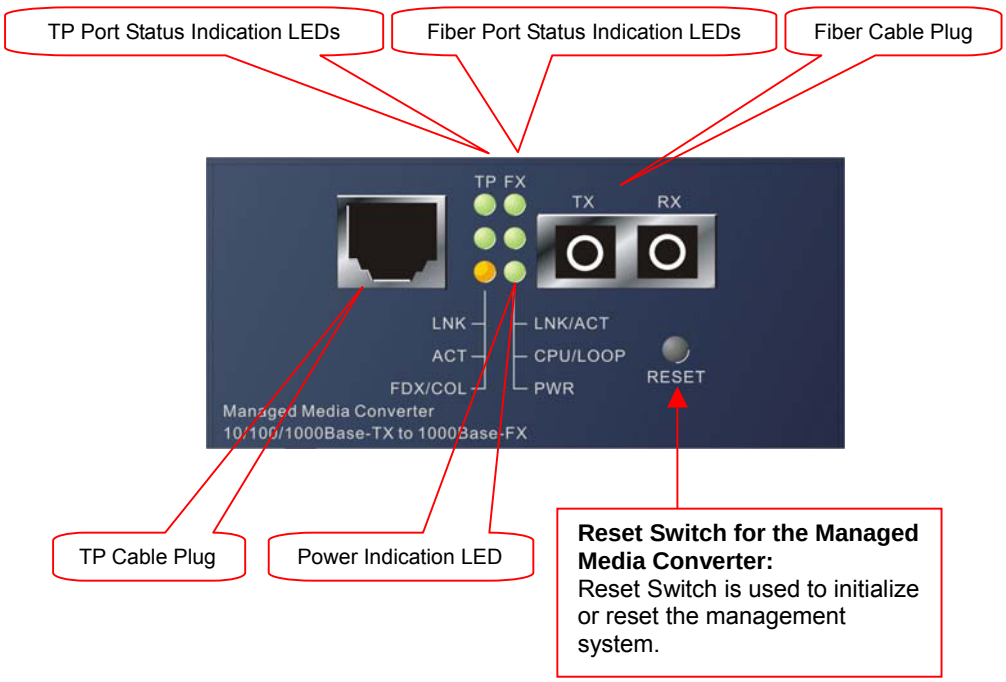


Fig. 1-2 Front View of the Managed Media Converter

LED Indicators

LED	Color	Function
	System LED	
Power	Green	Lit when +5V power is on and good
CPU/Loop	Green	Lit when CPU is on and good Blinks when loop test is present
	10/100/1000Mbps Ethernet TP Port LED	
Link	Green	Lit when 1000/100/10Mbps connection with remote device is good Off when cable connection is not good
ACT	Green	Blinks when any traffic is present
FDX/COL	Amber	Lit when full-duplex mode is active Off when half-duplex mode is active Blinks when any collision is present
	1000Mbps Fast Ethernet FX Port LED	
Link/ACT	Green	Lit when connection with remote device is good Blinks when any traffic is present Off when cable connection is not good

Table1-1

1-4-2. User Interfaces on the Rear Panel View

The serial port cable is attached directly to a DCE device through RS-232 cable for console management.

Fig. 1-3 Rear View of the Managed Media Converter

2. Installation

2-1. Network System Wide Basic Configuration

The RC-2201/02 Converter has RJ-45 with auto MDIX and Fiber connection for different types, including SC/ST, MT-RJ, VF-45, LC, BiDi-SFF and BiDi-SC. For more details on the standard technical specification, please refer to Appendix A.

Two typical applications for the RC-2201/02 Converter:

- Central Site/Remote site application is used in carrier or ISP. (See Fig. 2-1)
- Peer-to-peer application is used in two remote offices. (See Fig. 2-2)

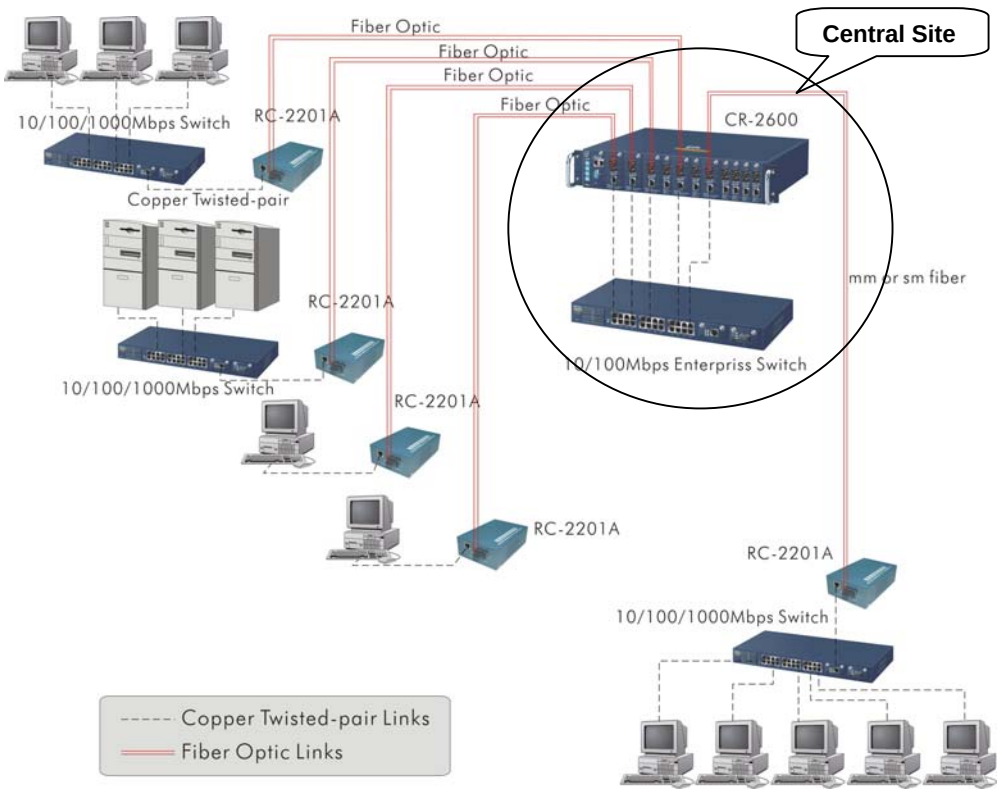


Fig. 2-1 Network Connection between Remote Site and Central Site

Fig. 2-1 is a system wide basic reference connection diagram. This diagram demonstrates how RC-2201/02 Converter connects with other network devices and hosts.

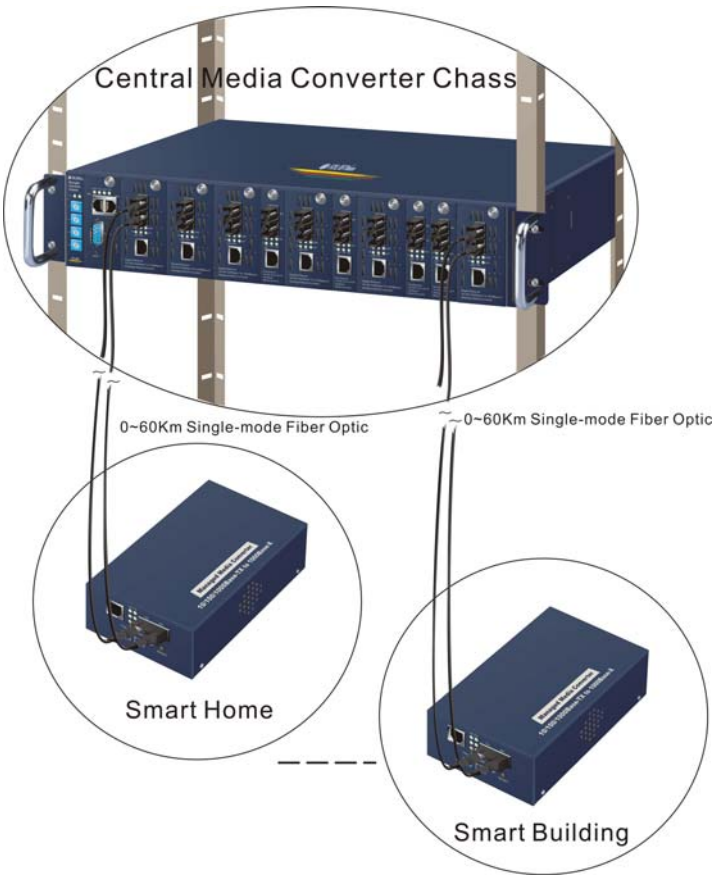


Fig. 2-2 Single-mode Fiber Optic Network Configuration

The Managed Media Converter embedded web server, SNMP agent and Telnet software, etc. can be used at a remote PC with any installed web browser, SNMP or Telnet application to do network management. PC Web/SNMP Network Management station can be installed at either the central or user site.

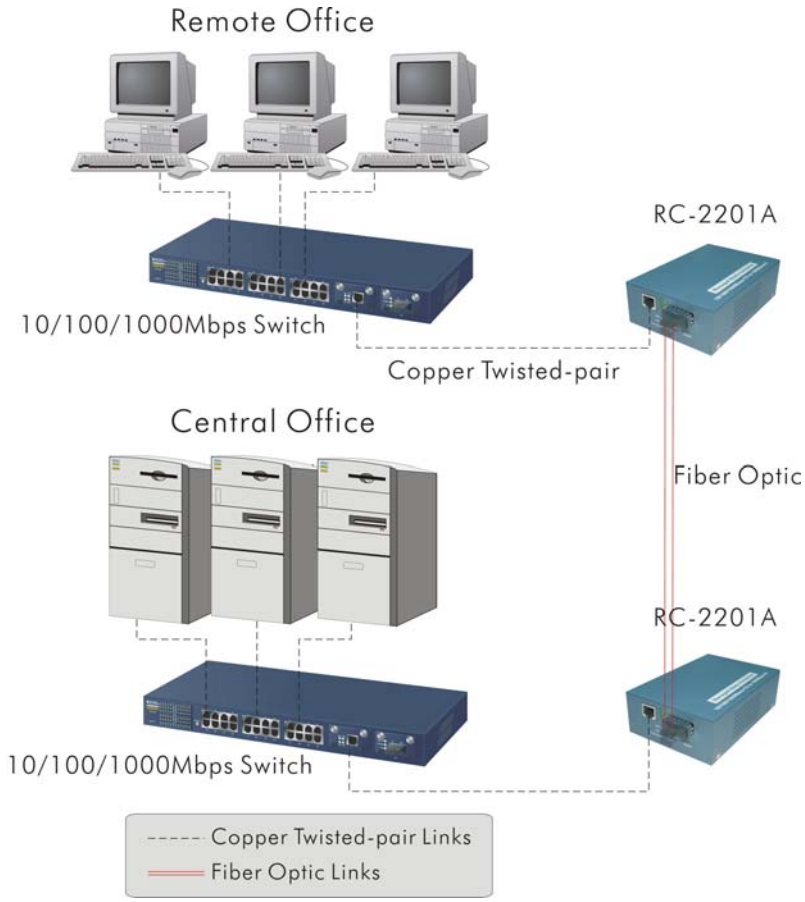


Fig. 2-3 Office-to-Office Network Connection

2-2. Starting RC-2201/02 up

This section will give users a quick start for:

- Battery Installation (For RC-2202 Only)
- Cable and Hardware Installation
- Management Station Installation
  - Software booting and configuration

2-2-1. Battery Installation (For RC-2202 Only)

- **Ways of Installing the Battery:**

1. After powering off the converter, unscrew the vacant slot dummy panel at the bottom of the converter.
2. Then, connect the connectors of the battery and the socket at the bottom of the converter with each other. (Please note that the red cord must be linked to the red one and the black cord also must be linked to the black one.)
3. Fasten the vacant slot dummy panel and then reboot the converter.

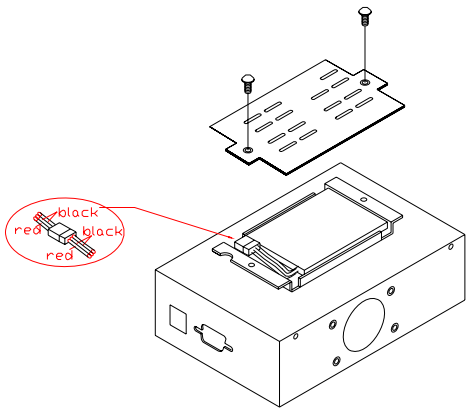


Fig. 2-4 Battery Installation

Note: The battery cannot be taken out when the converter is powered on. If you would like to replace the battery, you should power the converter off in advance and then reboot it again after completing the installation of battery.

- **Ways of Unloading the Battery:**

1. After powering off the converter, unscrew the vacant slot dummy panel at the bottom of the converter.
2. You can unload the battery after disconnecting the battery connector from the converter.

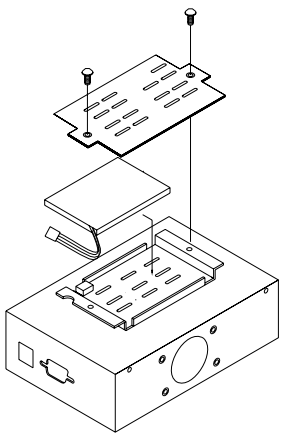


Fig. 2-5 Unload the Battery from the Converter

Note: The battery will be charged automatically after you had installed it and rebooted the converter.

2-2-2. Cable and Hardware Installation

⇒ Wear a grounding device for electrostatic discharge
⇒ Verify that the AC-DC adapter conforms to your country AC power requirement and then insert the power plug

• **TP Cable**

⇒ Use Cat. 5 TP cable to connect server/host or workstation to TP port of the converter
⇒ TP port supports MDI/MDI-X auto-crossover, use:
  — straight-through cable (Cable pin-outs for RJ-45 jack 1, 2, 3, 6 to 1, 2, 3, 6) to cascade or up-link the converter to an upper layer L2/L3 switch or server/host/workstation
⇒ TP Cable Limitations: Cat. 5 and up to 100m

• **Fiber Cable**

⇒ Use fiber cable to connect FX port of an upper layer converter
⇒ Fiber Cable Limitations:

SC/ST/LC Converter Models	
Multi-mode Full-duplex	220m
Single-mode Full-duplex	10/30/50Km

Table 2-1

Note: The other side of the fiber cable plugged into the converter's RX connector at the near end should plug into the FX device's TX connector at the far end, and vice versa.

The following table lists the types of fiber we support, and those else not listed here are available upon request.

IEEE 802.3z Gigabit Ethernet 1000SX 850nm	Multi-mode Fiber Cable and Modal Bandwidth			
	Multi-mode 62.5/125μm		Multi-mode 50/125μm	
	Modal Bandwidth	Distance	Modal Bandwidth	Distance
	160MHz-Km	* 220m	400MHz-Km	500m
	200MHz-Km	275m	500MHz-Km	550m
1000LX	RC-2201SC.S10/30/50Km			
	Single-mode Fiber 9/125μm			
	Single-mode transceiver 1310nm 10Km			
	Single-mode transceiver 1550nm 30, 50Km			
1000Base-LX Single Fiber WDM	RC-2201BS3.S20	Single-Mode *20Km	TX(Transmit)	1310nm
			RX(Receive)	1550nm
	RC-2201BS5.S20	Single-Mode *20Km	TX(Transmit)	1550nm
			RX(Receive)	1310nm

*: Default module

Table 2-2

Note:
• The other side of the fiber cable plugged into the converter's RX connector at the near end should plug into the FX device's TX connector at the far end, and vice versa.
• RC-2201BS5.S20 and RC-2201BS3.S20 must be installed in pairs, i.e. install RC-2201BS5.S20 at one end and RC-2201BS3.S20 at the other end.

2-2-3. Management Station Installation

RC-2201/02 converter is equipped with the serial port (RS-232), Ethernet 10/100/1000 TP port and Ethernet 1000FX port. The users can use any port to access and set up system configuration of RC-2201/02 converter.

Section 2-2-3-1: Installing management station through RC-2201/02 converter's RS-232 port running Terminal utility.
Section 2-2-3-2: Installing management station through RC-2201/02 converter's TP port running Telnet or browser software.
Section 2-2-3-3: Installing management station through RC-2201/02 converter's Fiber port running Telnet or browser software via Central Site Converter Chassis.

RC-2201/02 converter, Telnet and browser stations must assign the proper IP address, subnet mask and default Gateway accordingly.

2-2-3-1. Installing Management Station through RC-2201/02 RS-232 Port

The serial port cable is attached directly to a DCE device through RS-232 cable for console management.

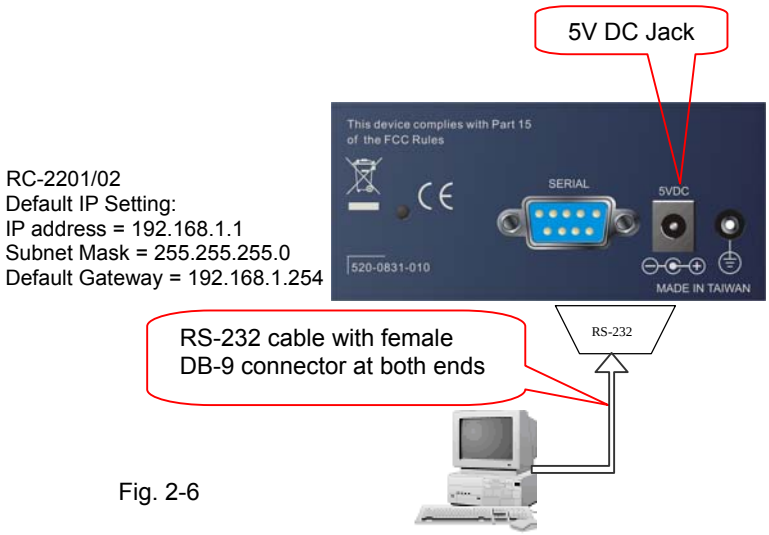


Fig. 2-6

To connect the Managed Media Converter to the console user interface:

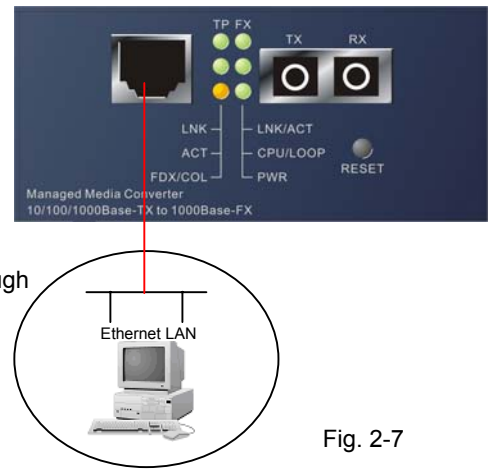
1. Locate the correct DB-9 serial port RS-232 cable with female DB-9 connector. Please refer to Appendix B for more details on Null Modem Cable Specifications.
2. Attach the DB-9 female cable connector to the male DB-9 serial port connector on the Managed Media Converter.
3. Attach the other end of the DB-9 serial port cable to an ASCII terminal emulator. For example, Windows98/2000/XP HyperTerminal utility. RC-2201/02 converter uses the following serial port parameter values:

Baud rate	57600
Stop bits	1
Data bits	8
Parity	N
Flow control	none

4. When the terminal emulator connected to RC-2201/02, then press **<Enter>** key, the login prompt will be shown on the screen. The default username and password are shown as below:
   Username = admin
   Password = admin
5. Please refer to Section 4-1 Console Management for details about console user interface operating description.

2-2-3-2. Installing Management Station through RC-2201/02 TP Port

RC-2201/02
Default IP Setting:
IP = 192.168.1.1
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254



Network Management Station through
RC-2201/02 TP Port
Assign a reasonable IP address,
for example:
IP = 192.168.1.2
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254

Fig. 2-7

In Fig. 2-7, it is a simple example to show you the first step to connect to your PC and the converter.

1. Attach Cat. 5 TP cable to connect PC and TP port of the RC-2201/02 converter.
2. Boot up the converter.
3. Either run a terminal simulator and invoke a telnet session on PC, or run browser software.

Right now, you can read the menu with text screen as Fig. 2-8. Input the default username “admin” and the default password “admin”, then you will read the next page as Fig. 2-9.

Use the **<Up/Down>** arrow keys to move the cursor to locate the entry of the Configuration in the menu, then press **<Enter>** key on the PC to select the item. Now, the page for IP address configuration is shown and then also moves the cursor to the entry of the IP Configuration, then press **<Enter>** key to select the item you choose.

Gigabit Managed Media Converter – RC-2201/02

Fig. 2-8

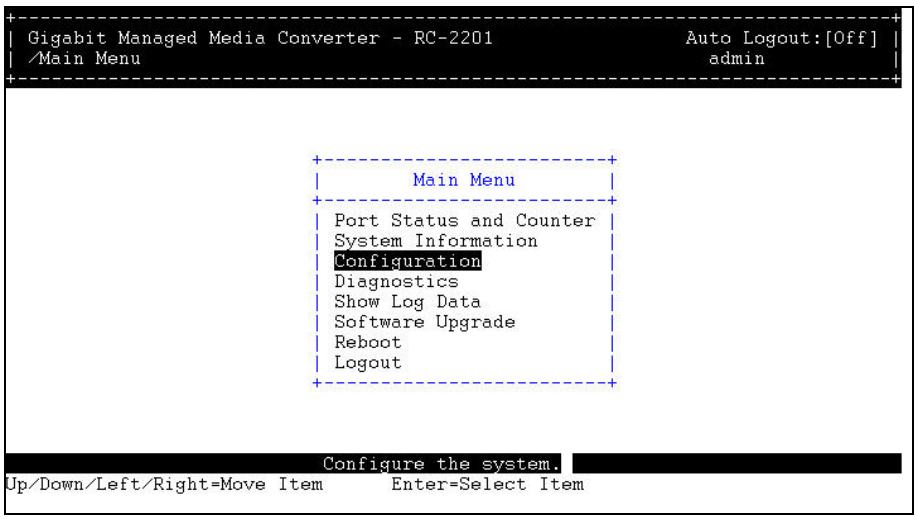
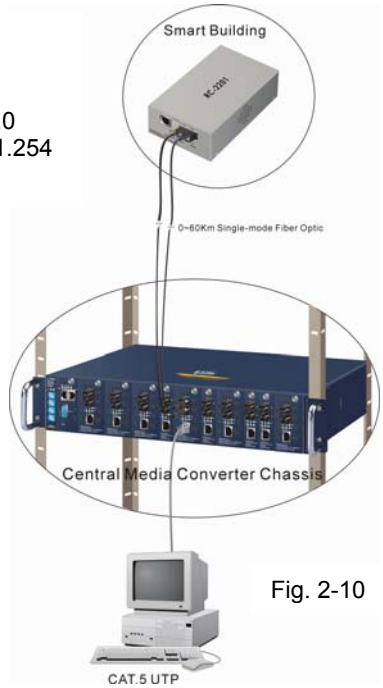


Fig. 2-9

2-2-3-3. Installing Management Station through RC-2201/02 Fiber Port via Central Site Converter Chassis

RC-2201/02
Default IP Setting:
IP = 192.168.1.1
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254



Network Management Station through RC-2201/02 Fiber Port via Central Site Converter Chassis
Assign a reasonable IP address,
for example:
IP = 192.168.1.2
Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254

Fig. 2-10

Warning:

Both RC-2201/02 converter and PC/station's IP must be in a same subnet, please assign a proper subnet mask.

To connect RC-2201/02 fiber port to the central site management station via fiber optic cable:

1. Locate the fiber network cable with the male fiber connector.
2. Attach the male fiber connector to the Managed Media Converter.
3. Attach the other end of cable to the Central Media Converter Chassis.
4. At central site:
   - Install and connect a PC to TP port of the Central Media Converter Chassis with Cat. 5 UTP network cable (or via a switch).
   - Assign a reasonable public or private IP address in accordance with each network site. Please refer to Fig. 2-10 about the Managed Media converter default IP address information.

2-2-4. IP Address Assignment

For IP address configuration, there are four parameters needed to be filled in. They are IP address, Subnet Mask, Default Gateway and DNS.

IP address:

The address of the network device in the network is used for internetworking communication. Its address structure looks is shown in the Fig. 2-11. It is “classful” because it is split into predefined address classes or categories.

Each class has its own network range between the network identifier and host identifier in the 32 bits address. Each IP address comprises two parts: network identifier (address) and host identifier (address). The former indicates the network where the addressed host resides, and the latter indicates the individual host in the network which the address of host refers to. And the host identifier must be unique in the same LAN. Here the term of IP address we used is version 4, known as IPv4.

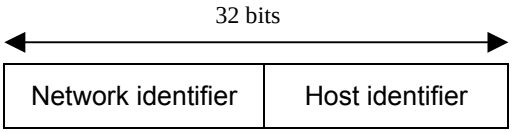
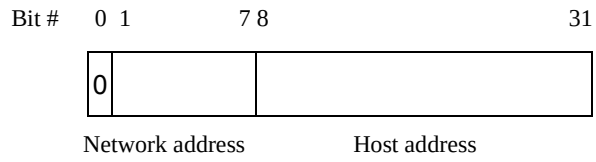


Fig. 2-11 IP address structure

With the classful addressing, it divides IP address into three classes, class A, class B and class C. The rest of IP addresses are for multicast and broadcast. The bit length of the network prefix is the same as that of the subnet mask and is denoted as IP address/X, for example, 192.168.1.0/24. Each class has its address range described below.

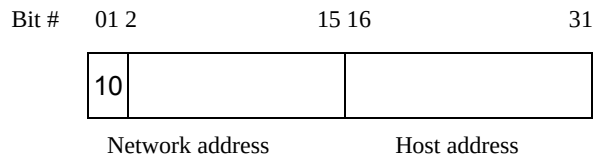
Class A:

Address is less than 126.255.255.255. There are a total of 126 networks can be defined because the address 0.0.0.0 is reserved for default route and 127.0.0.0/8 is reserved for loopback function.



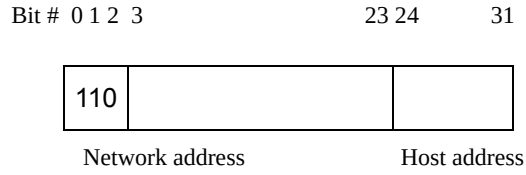
Class B:

IP address range between 128.0.0.0 and 191.255.255.255. Each class B network has a 16-bit network prefix followed 16-bit host address. There are 16,384 (2^14)/16 networks able to be defined with a maximum of 65534 (2^16 –2) hosts per network.



Class C:

IP address range between 192.0.0.0 and 223.255.255.255. Each class C network has a 24-bit network prefix followed 8-bit host address. There are 2,097,152 (2^21)/24 networks able to be defined with a maximum of 254 (2^8 –2) hosts per network.



Class D and E:

Class D is a class with first 4 MSB (Most significance bit) set to 1-1-1-0 and is used for IP Multicast. See also RFC 1112. Class E is a class with first 4 MSB set to 1-1-1-1 and is used for IP broadcast.

According to IANA (Internet Assigned Numbers Authority), there are three specific IP address blocks reserved and able to be used for extending internal network. We call it Private IP address and list below:

Class A	10.0.0.0 --- 10.255.255.255
Class B	172.16.0.0 --- 172.31.255.255
Class C	192.168.0.0 --- 192.168.255.255

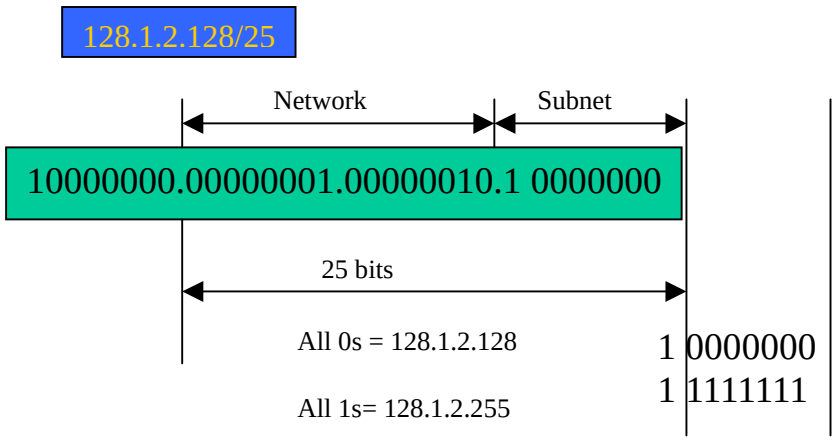
Please refer to RFC 1597 and RFC 1466 for more information.

Subnet mask:

It means the sub-division of a class-based network or a CIDR block. The subnet is used to determine how to split an IP address to the network prefix and the host address in bitwise basis. It is designed to utilize IP address more efficiently and ease to manage IP network.

For a class B network, 128.1.2.3, it may have a subnet mask 255.255.0.0 in default, in which the first two bytes is with all 1s. This means more than 60 thousands of nodes in flat IP address will be at the same network. It's too large to manage practically. Now if we divide it into smaller network by extending network prefix from 16 bits to, say 24 bits, that's using its third byte to subnet this class B network. Now it has a subnet mask 255.255.255.0, in which each bit of the first three bytes is 1. It's now clear that the first two bytes is used to identify the class B network, the third byte is used to identify the subnet within this class B network and, of course, the last byte is the host number.

Not all IP address is available in the sub-netted network. Two special addresses are reserved. They are the addresses with all zero's and all one's host number. For example, an IP address 128.1.2.128, what IP address reserved will be looked like? All 0s mean the network itself, and all 1s mean IP broadcast.



In this diagram, you can see the subnet mask with 25-bit long, 255.255.255.128, contains 126 members in the sub-netted network. Another is that the length of network prefix equals the number of the bit with 1s in that subnet mask. With this, you can easily count the number of IP addresses matched. The following table shows the result.

Prefix Length	No. of IP matched	No. of Addressable IP
/32	1	-
/31	2	-
/30	4	2
/29	8	6
/28	16	14
/27	32	30
/26	64	62
/25	128	126
/24	256	254
/23	512	510
/22	1024	1022
/21	2048	2046
/20	4096	4094
/19	8192	8190
/18	16384	16382
/17	32768	32766
/16	65536	65534

Table 2-3

According to the scheme above, a subnet mask 255.255.255.0 will partition a network with the class C. It means there will have a maximum of 254 effective nodes existed in this sub-netted network and is considered a physical network in an autonomous network. So it owns a network IP address which may looks like 168.1.2.0.

With the subnet mask, a bigger network can be cut into small pieces of network. If we want to have more than two independent networks in a worknet, a partition to the network must be performed. In this case, subnet mask must be applied.

For different network applications, the subnet mask may look like 255.255.255.240. This means it is a small network accommodating a maximum of 15 nodes in the network.

Default gateway:

For the routed packet, if the destination is not in the routing table, all the traffic is put into the device with the designated IP address, known as default router. Basically, it is a routing policy.

For assigning an IP address to RC-2201/02, you just have to check what the IP address of the network will be connected withRC-2201/02. Use the same network address and append your host address to it.

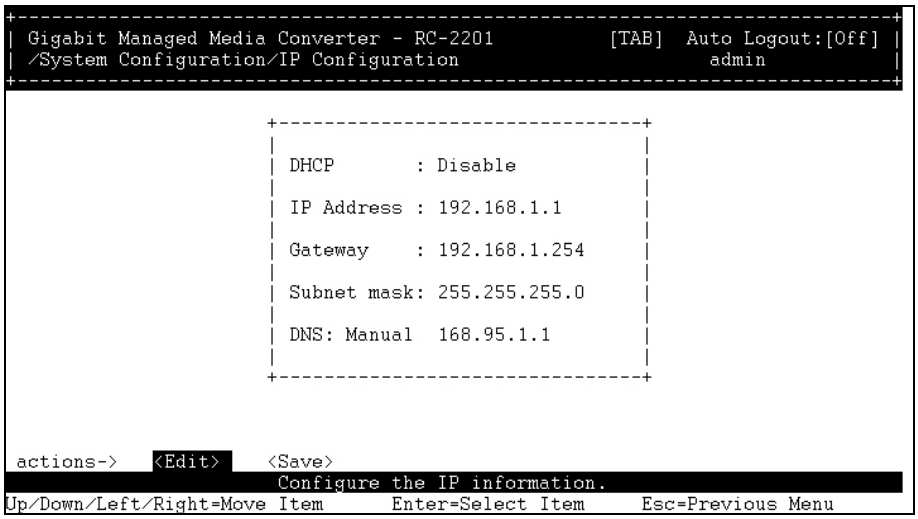


Fig. 2-12

First, IP Address: as shown in the Fig. 2-12, enter “192.168.1.1”, for instance. For sure, an IP address such as 192.168.1.x must be set on your PC.

Second, Subnet Mask: as shown in the Fig. 2-12, enter “255.255.255.0”. Any subnet mask such as 255.255.255.x is allowable in this case.

DNS:

The Domain Name Server translates human readable machine name to IP address. Every machine on the Internet has a unique IP address. A server generally has a static IP address. To connect to a server, the client needs to know the IP of the server. However, user generally uses the name to connect to the server. Thus, the RC-2201 DNS client program (such as a browser) will ask the DNS to resolve the IP address of the named server.

3. Operation of Web-based Management

1. The converter provides a web function by Ethernet Port (Browser) to manage and monitor the port activity. If you need to change the IP address at the first time, you can use the console to modify and also refer to Chapter 4 for more details.

   The default values of RC-2201/02 converter are as follows:
   IP Address :192.168.1.1
   Subnet Mask :255.255.255.0
   Default Gateway :192.168.1.254
   Username :admin
   Password :admin

2. After the converter had been configured via the console, you can browse it. For instance, http://192.168.1.1, then enter the username and password as above. Both of the default username and password are “admin”.

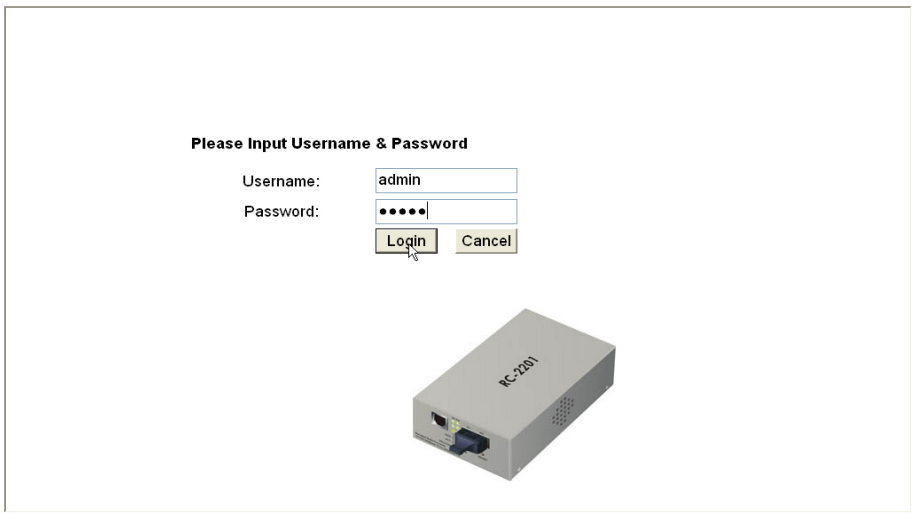


Fig. 3-1

3-1. Web Management Home Overview

Home Page and Main MENU will be shown up after you fill in “admin” to serve as username as well as password and click the **<Login>** button. The main functions will be listed on the left side of a browser. On the top is the front panel view of the converter. In the middle is the basic System Information. The main functions will be introduced in the following sections.

On the front panel, the LEDs will display the status color which is the same as physical hardware. The fiber and TP plug will display the status color as well. Green stands for “connected” status and red stands for “disconnected” one.

The main functions are “Port Status and Counter”, “System Information”, “Configuration”, “Diagnostics”, “Show Log Data”, “Software Upgrade”, “Reboot” and “Logout”.

Function name:

System Information

Function description:

Show the basic system information.

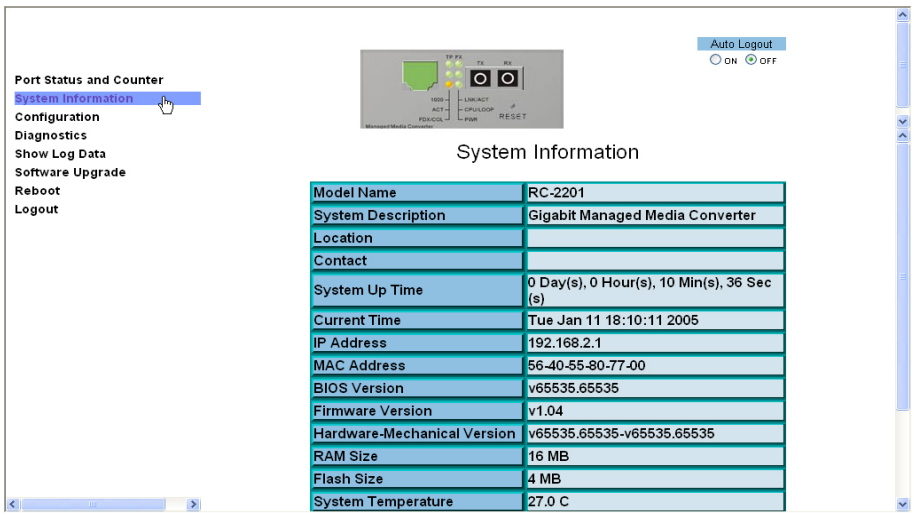


Fig. 3-2

Parameter description:

Model Name:

The model name of this product.

System Description:

Managed Media Converter

Location:

Basically, it is the location where this converter is put. User-defined.

Contact:

Basically, it is the contact window in charge of the maintenance of this converter. User-defined.

System Up Time:

The time accumulated since this converter is powered up. Its format is day, hour, minute, second.

Current Time:

Show the system time of RC-2201/02. Its format: day of week, month, day, hours : minutes : seconds, year. For instance, Wed, Apr. 06, 12:10:10, 2004.

IP Address:

The IP address that indicates where RC-2201/02 is located (e.g. default IP address of RC-2201/02 is 192.168.1.1).

MAC Address:

It is the MAC address of the management agent in this converter.

BIOS Version:

The version of the BIOS in this converter.

Firmware Version:

The firmware version in this converter.

Hardware-Mechanical Version:

The version of Hardware and Mechanical. The figure before the hyphen is the version of electronic hardware; the one after the hyphen is the version of mechanical.

RAM Size:

The size of the DRAM in this converter.

Flash Size:

The size of the flash memory in this converter.

System Temperature:

The air temperature inside of this converter.

Series Number:

The serial number is assigned by manufacturer.

Device Port:

Show all types and numbers of the port. In RC-2201/02, there are one serial port, one TP port and one FX port.

Fiber Port:

Show the connector type (e.g. SC/LC), fiber mode (e.g. Single/Multi mode) status and number of fiber port.

Case Detection:

Show the status of the upper case of this converter. When the case is lid off, it shows “Open”; otherwise, it shows “Close”.

3-2. The Function Tree in Web Management

For offering you a clear guide to use this Managed Media Converter, the following is the whole function tree of RC-2201/02 in web management. User can refer to the following sections based on the order of this function tree below for more details.

- **Port Status and Counter**
  - Port Current Status
  - Port Counters
  - Port Configuration
- **System Information**
- **Configuration**
  - System Configuration
    - Username/Password Setting
    - IP Configuration
    - System Time Setting
    - Location/Contact Setting
    - TP Port Management
    - Power Down Setting
  - Network Management
    - SNMP Configuration
    - Max. Packet Length Setting
    - Broadcasting Suppression
    - Misc. Feature Configuration
    - Spanning Tree Configuration
    - Filtering Configuration
    - VLAN Configuration
  - Trap/Alarm Configuration
    - Trap Events Configuration
    - Alarm Configuration
  - Save Configuration
    - Save As User Configuration
    - Restore Default Configuration
    - Restore User Configuration

- **Diagnostics**
  - Diagnostics
  - Loopback Test
  - Ping Test
  - Auto Ping Configuration
- **Show Log Data**
  - Trap Log Data
  - Illegal Access Report Config.
    - Illegal Access Report Status
    - Illegal Access Report
  - Mac Alias
- **Software Upgrade**
- **Reboot**
- **Logout**

3-3. Port Status and Counter

Function name:

Port Current Status

Function description:

Display the current port status of RC-2201/02.

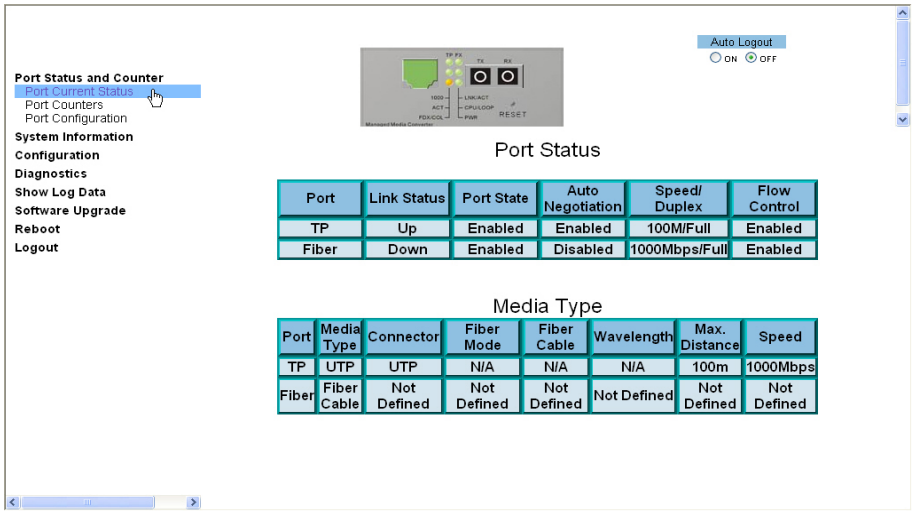

Auto Logout
ON OFF
Port Status and Counter
Port Current Status
Port Counters
Port Configuration
System Information
Configuration
Diagnostics
Show Log Data
Software Upgrade
Reboot
Logout
RESET
Port Status
Port | Link Status | Port State | Auto Negotiation | Speed/ Duplex | Flow Control
TP | Up | Enabled | Enabled | 100M/Full | Enabled
Fiber | Down | Enabled | Disabled | 1000Mbps/Full | Enabled
Media Type
Port | Media Type | Connector | Fiber Mode | Fiber Cable | Wavelength | Max. Distance | Speed
TP | UTP | UTP | N/A | N/A | N/A | 100m | 1000Mbps
Fiber | Fiber Cable | Not Defined | Not Defined | Not Defined | Not Defined | Not Defined | Not Defined

Fig. 3-3

Parameter description:

Port:

Display TP / Fiber port. The TP Port is RC-2201/02's Ethernet 10/100/1000Mbps UTP interface. The Fiber Port is RC-2201/02's Ethernet 1000Mbps Fiber interface.

Link Status: UP, Down

Show if the link on the port is active. If the link is connected to a working well device, the Link will show the link "Up", otherwise, "Down". This is determined by the negotiation of hardware.

Port State:

Show if the communication capability of the port is Enabled or Disabled. When enabled, traffic can be transmitted and received via this port. When disabled, no traffic can be transferred through this port. Port State is configured by user. Default is Enabled.

Auto Negotiation:

Show the exchange mode of Ethernet MAC. There are two modes supported in RC-2201/02. They are auto-negotiation mode “Enabled” and forced mode “Disabled”. When in “Enabled” mode, this function will automatically negotiate by hardware itself and exchange each other the capability of speed and duplex mode with other site which is linked, and come out the best communication way. When in “Disabled” mode, both parties must have the same setting of speed and duplex, otherwise, both will not be linked. In this case, the link result is “Down”.

Default: TP port is Enabled mode, Fiber port is Disabled mode.

Speed/Duplex:

Display the speed and duplex of all port. There are two speeds 10Mbps and 100Mbps supported in RC-2201/02. The duplex supported is half duplex and full duplex. The status of speed/duplex mode is determined by 1) the negotiation of both local port and link partner in “Enabled” mode or 2) user setting in “Disabled” mode. The local port has to be preset its capability.

In TP port is supported Fast Ethernet with TP media, so the result will show 100Mbps/full duplex, 100Mbps/half duplex, 10Mbps/Full duplex and 10Mbps/half duplex.

In Fiber port is supported Fast Ethernet with Fiber media, so the result will show 100Mbps/full duplex or 100Mbps/half duplex.

Default: TP port: None, depends on the result of the negotiation

Fiber port: 100Mbps/Full duplex

Flow Control: Enabled, Disabled

Show each port’s flow control status. There are two types of flow control in Ethernet, Backpressure for half-duplex operation and Pause flow control (IEEE802.3x) for full-duplex operation. RC-2201/02 supports both of them. When duplex mode is half duplex, there is only one status “Enabled” for flow control. When in full duplex, it may be one of “Enabled”, or “Disabled”. Default: Enabled

Media Type: UTP Cable, Fiber Cable

Only “Fiber Cable” and “UTP Cable” are in this model.

Connector:

Display the connector type, for instance, UTP, SC, ST, LC and so on.

Fiber Mode:

Display the fiber mode, for instance, Multi-Mode, Single-Mode.

Fiber Cable:

Display the cable type, for instance, Dual Wire, Single Wire.

Wavelength:

Display the wavelength of the light transmitted in the fiber, for instance, 1310nm, 1550nm.

Max. Distance:

Display the maximum distance the port supported, for instance, 100m, 20km, 40km and so on.

Speed:

Display the maximum speed of the port, for instance, “1G”, “100M”.

Function name:

Port Counters

Function description:

Display the counting of each port's traffic, sorted according to the items described in the parameter description.

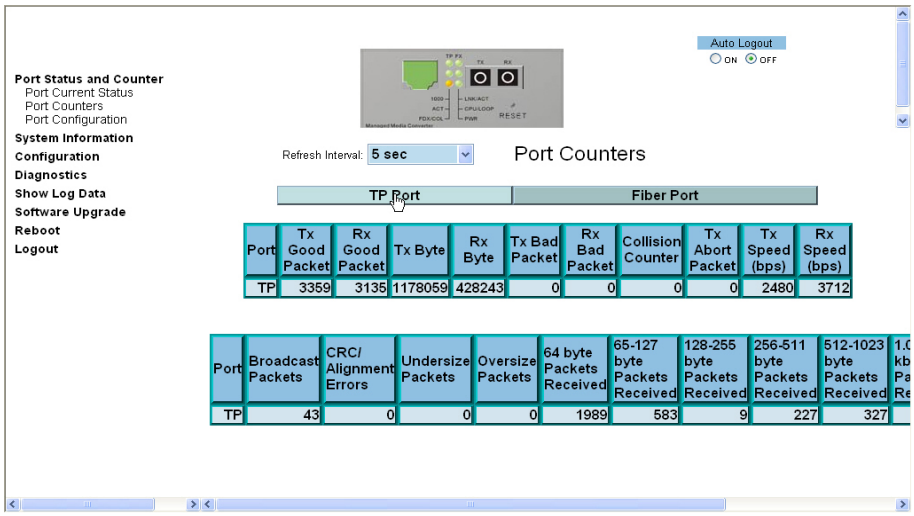

Auto Logout
ON OFF
Port Status and Counter
Port Current Status
Port Counters
Port Configuration
System Information
Configuration
Diagnostics
Show Log Data
Software Upgrade
Reboot
Logout
Refresh Interval: 5 sec
Port Counters
TP Port
Fiber Port
Port | Tx Good Packet | Rx Good Packet | Tx Byte | Rx Byte | Tx Bad Packet | Rx Bad Packet | Collision Counter | Tx Abort Packet | Tx Speed (bps) | Rx Speed (bps)
TP | 3359 | 3135 | 1178059 | 428243 | 0 | 0 | 0 | 0 | 2480 | 3712
Port | Broadcast Packets | CRC/ Alignment Errors | Undersize Packets | Oversize Packets | 64 byte Packets Received | 65-127 byte Packets Received | 128-255 byte Packets Received | 256-511 byte Packets Received | 512-1023 byte Packets Received
TP | 43 | 0 | 0 | 0 | 1989 | 583 | 9 | 227 | 327

Fig. 3-4

Parameter description:

Refresh Interval:

A Refresh Interval selection list on the web is used to set or change web view counters refresh period. It can be set from 3 seconds to 10 seconds.

TP Port:

Ethernet 10/100/1000Mbps UTP interface of RC-2201/02.

Fiber Port:

Ethernet 1000Mbps Fiber interface of RC-2201/02.

Tx Good Packet:

The counting number of the packet transmitted successfully.

Rx Good Packet:

The counting number of the packet received which is treated as good.

Tx Byte:

Total transmitted bytes.

Rx Byte:

Total received bytes.

Tx Bad Packet:

The counting number of the packet transmitted abnormally.

Rx Bad Packet:

The counting number of the packet received which is treated as bad.

Collision Counter:

Collision times.

Tx Abort Packet:

The counting number of the packet aborted during transmission.

Tx Speed (bps):

Show the average transmission rate in bit per second. The time interval is user-defined.

Rx Speed (bps):

Show the average received data rate in bit per second. The time interval is user-defined.

Broadcast Packets:

Show the counting number of the broadcast packet.

CRC/Alignment Errors:

Show the counting number of the packet with CRC and Alignment error.

Undersize Packets:

Show the counting number of the packet with the length less than 64 bytes.

Oversize Packets:

Show the counting number of the packet with the length more than 1522/1536 bytes depend on maximum packet length setting.

64 byte Packets Received:

Show the counting number of the packet with exact 64 bytes length.

65-127 byte Packets Received:

Show the counting number of the packet with the length between 65 to 127 bytes.

128-255 byte Packets Received:

Show the counting number of the packet with the length between 128 to 255 bytes.

256-511 byte Packets Received:

Show the counting number of the packet with the length between 256 to 511 bytes.

512-1023 byte Packets Received:

Show the counting number of the packet with the length between 512 to 1023 bytes.

1.0-1.5 kbyte Packets Received:

Show the counting number of the packet with the length between 1024 to 1536 bytes.

Unicast Packets Transmitted:

Show the counting number of total unicast packets transmitted.

NonUnicast Packets Transmitted:

Show the counting number of both total multicast and broadcast packets transmitted.

Function name:

Port Configuration

Function description:

Change the state and configuration of each port.

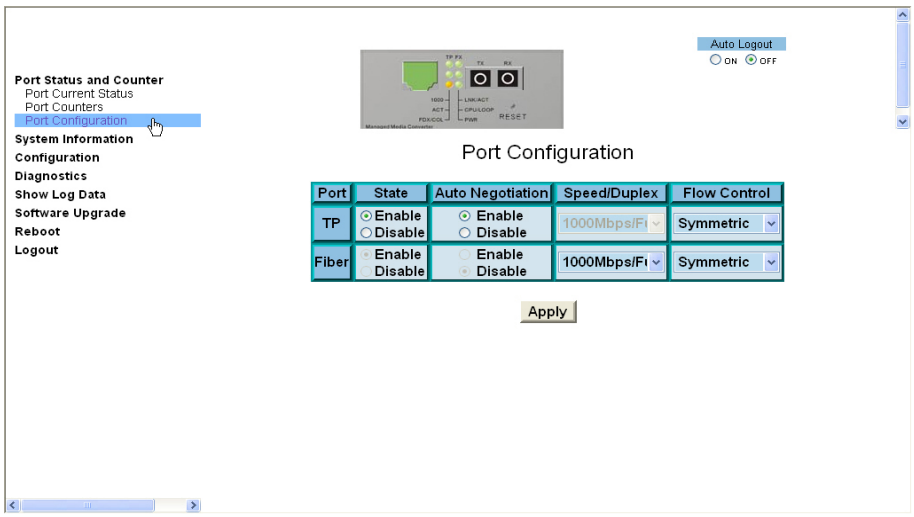


Fig. 3-5

Parameter description:

Port:

The TP Port is RC-2201/02's Ethernet UTP interface.

The Fiber Port is RC-2201/02's Ethernet Fiber interface.

State:

Show if the communication capability of the port is Enabled or Disabled. When enabled, traffic can be transmitted and received via this port. When disabled, the port is blocked and no traffic can be transferred through this port. Port State is configured by the user. Only two states "Enable" and "Disable" are able to be chosen. If you set a port's state "Disable", then that port is prohibited from passing any traffic, even it looks Link up. Default is Enable.

Auto Negotiation:

Only "Enable" and "Disable" two states can be chosen. "Enable" means the port adopted the auto-negotiation algorithm to exchange the capability with the linked partner. When enabled, the speed, duplex mode and flow control mode may change. "Disable" means the forced mode is adopted. When disabled, if you want to set up a connection successfully, you must have both port configuration of local port and linked partner be the same. If their configuration is different, the link will not be set up successfully. In RC-2201/02, fiber port supports forced mode only.

Speed/Duplex:

Set the mode of speed and duplex. In speed, 10/100/1000Mbps baud rate is available for Fast Ethernet TP port. The Fiber port is available in speed 1000Mbps only. If the media is 1Gbps fiber, it is always 1000Mbps and the duplex is full only. If the media is TP, the Speed/Duplex is comprised of the combination of speed mode, 10/100/1000Mbps, and duplex mode, full duplex and half duplex.

Flow Control:

There are three modes to choose in flow control, including Asymmetric, Symmetric and Disable. If Symmetric flow control is set, both parties can send PAUSE frame to the transmitting device(s) if the receiving port is too busy to handle. If Asymmetric flow control is set, this will let the receiving port not care the PAUSE frame from transmitting device(s). This is one-way flow control. When it is set Disable, there will be no flow control in the port. It drops the packet if too much to handle.

Default: Symmetric in full-duplex mode and Backpressure in half duplex.

3-4. Configuration

There are four major configuration function folders, including:

- **System Configuration**
  - Username / Password Setting
  - IP Configuration
  - System Time Setting
  - Location/Contact Setting
  - TP Port Management
  - Power Down Setting
- **Network Management**
  - SNMP Configuration
  - Max. Packet Length Setting
  - Broadcasting Suppression
  - Misc. Feature Configuration
  - Spanning Tree Configuration
  - Filtering Configuration
  - VLAN Configuration
- **Trap/Alarm Configuration**
  - Trap Events Configuration
  - Alarm Configuration
- **Save Configuration**
  - Save As User Configuration
  - Restore Default Configuration
  - Restore User Configuration

3-4-1. System Configuration

There are six functions contained in the System Configuration function folder. They are Username/Password Setting, IP Configuration, System Time Setting, Location/Contact Setting, TP Port Management and Power Down Setting.

3-4-1-1. Username / Password Setting

Function name:

Username/Password Setting

Function description:

In this function, only administrator can create, modify or delete the username and password. Administrator can modify other guest identities' password without confirming the password but it is necessary to modify the administrator-equivalent identity. Guest-equivalent identity can only modify his own password. Please note that you must confirm administrator/guest identity by pulling down the list of Authorization in advance before configuring the username and password. The default setting is as follows:

Username : admin
Password : admin

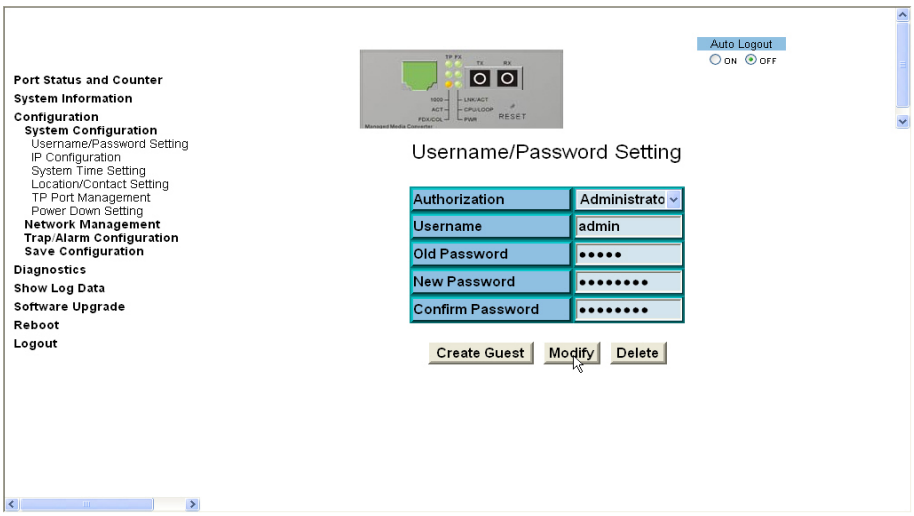


Fig. 3-6

3-4-1-2. IP Configuration

IP configuration is one of the most important configurations in RC-2201/02. Without the proper setting, network manager will not be able to see the device. RC-2201/02 supports both manual IP address setting and automatic IP address setting via DHCP server. When IP address is changed, you must reboot the converter to have the setting taken effect and use the new IP to browse for web management.

Function name:

IP Configuration

Function description:

Set IP address, subnet mask, default gateway and DNS for RC-2201/02.

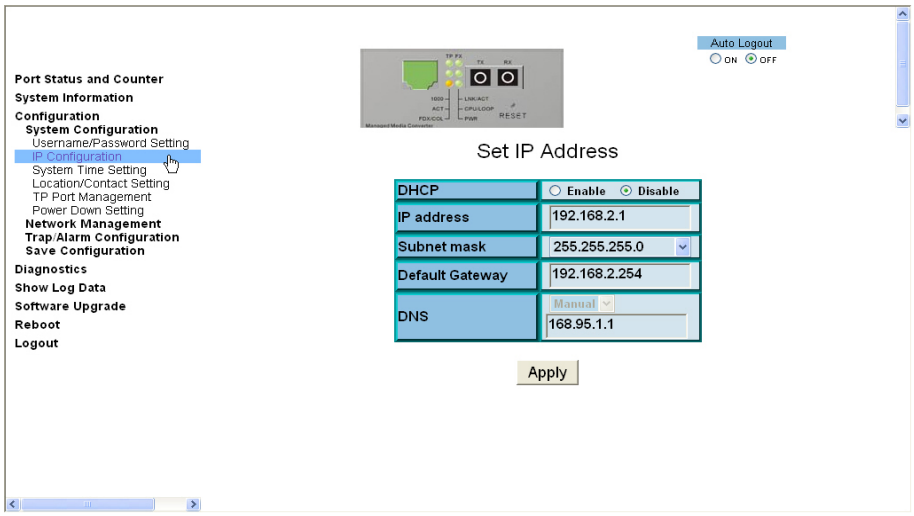


Fig. 3-7

Parameter description:

DHCP:

RC-2201/02 supports DHCP client used to get an IP address automatically if you set this function “Enable”. RC-2201/02 will find the DHCP server existed in the network to get an IP address. If DHCP server is down or does not exist and DHCP in RC-2201/02 is enabled, then RC-2201/02 will count down 60 seconds and use its fixed IP set last time. If this function is set “Disable”, you have to input IP address manually. For more details about IP address, please see the 2-2-4 section “IP Address Assignment” in this manual.

Default: Disable

IP address:

Users can configure the IP settings and fill in new values if users set the DHCP function “Disable”. Then, click **<Apply>** button to update it.

Default: 192.168.1.1

Subnet mask:

Set the subnet mask value which is the same as that of network it attaches. For more information, please also see the section “IP Address Assignment” in this manual.

Default: 255.255.255.0

Default gateway:

Set an IP address for a gateway to handle those packets that do not meet the rules predefined in a device. If a packet does not meet the criteria for other routers, then it must be sent to a default router. This means any packet with undefined TCP/IP information will be sent to this device unconditionally.

Default: 192.168.1.254

DNS:

Set an IP address for a Domain Name Server. The RC-2201/02 DNS client program will ask the Domain Name Server to resolve the IP address of the named host. To select the “Manual” for fixed DNS IP address setting. To select “Auto” the DNS IP address will be assigned from DHCP server. The default DNS setting is empty.

Default: DNS : -----

3-4-1-3. System Time Setting

RC-2201/02 provides manual and automatic ways to set the system time via NTP. Manual setting is simple and you just input “Year”, “Month”, “Day”, “Hour”, “Minute” and “Second” within the valid value range indicated in each item. If you input an invalid value, for example, 61 in minute, the converter will clamp the figure to 59.

NTP is a well-known protocol used to synchronize the clock of the RC-2201/02 system time over a network. NTP, an internet draft standard formalized in RFC 1305, has been adopted on the system is version 3 protocol. RC-2201/02 provides four built-in NTP server IP addresses resided in the Internet and an user-defined NTP server IP address. The time zone is Greenwich-centered which uses the expression form of GMT+/- xx hours.

Function name:

System Time Setting

Function description:

Set the system time by manual input or set it by syncing from Time servers. The function also supports daylight saving for different area’s time adjustment.

Parameter description:

Manual:

This is the function to adjust the time manually. Filling the valid figures in the fields of Year, Month, Day, Hour, Minute and Second respectively and press **<Apply>** button, time is adjusted. The valid figures for the parameter Year, Month, Day, Hour, Minute and Second are >=2000, 1-12, 1-31, 0-23, 0-59 and 0-59 respectively. Input the wrong figure and press **<Apply>** button, the device will reject the time adjustment request. There is no time zone setting in Manual mode.

Default: Year = 2000, Month = 1, Day = 1
Hour = 0, Minute = 0, Second = 0

NTP:

NTP is Network Time Protocol and is used to sync the network time based Greenwich Mean Time (GMT). If use the NTP mode and select a built-in NTP time server or manually specify an user-defined NTP server as well as Time Zone, RC-2201/02 will sync the time in a short after pressing **<Apply>** button. Though it synchronizes the time automatically, NTP does not update the time periodically without user's processing.

Time Zone is an offset time off GMT. You have to select the time zone first and then perform time sync via NTP because RC-2201/02 will combine this time zone offset and updated NTP time to come out the local time, otherwise, you will not able to get the correct time. RC-2201/02 supports configurable time zone from –12 to +13 step 1 hour.

Default Time zone: +8 Hrs.

Daylight Saving:

Daylight saving is adopted in some countries. If set, it will adjust the time lag or in advance in unit of hours, according to the starting date and the ending date. For example, if you set the day light saving to be 1 hour. When the time passes over the starting time, the system time will be increased one hour after one minute at the time since it passed over. And when the time passes over the ending time, the system time will be decreased one hour after one minute at the time since it passed over.

RC-2201/02 supports valid configurable day light saving time is –5 ~ +5 step one hour. The zero for this parameter means it need not have to adjust current time, equivalent to in-act daylight saving. You don't have to set the starting/ending date as well. If you set daylight saving to be non-zero, you have to set the starting/ending date as well; otherwise, the daylight saving function will not be activated.

Default for Daylight Saving: 0.

The following parameters are configurable for the function Daylight Saving and described in detail.

Day Light Saving Start :

This is used to set when to start performing the daylight saving time.

Mth:

Range is 1 ~ 12.

Default: 1

Day:

Range is 1 ~ 31.

Default: 1

Hour:

Range is 0 ~ 23.

Default: 0

Day Light Saving End :

This is used to set when to stop performing the daylight saving time.

Mth:

Range is 1 ~ 12.

Default: 1

Day:

Range is 1 ~ 31.

Default: 1

Hour:

Range is 0 ~ 23.

Default: 0

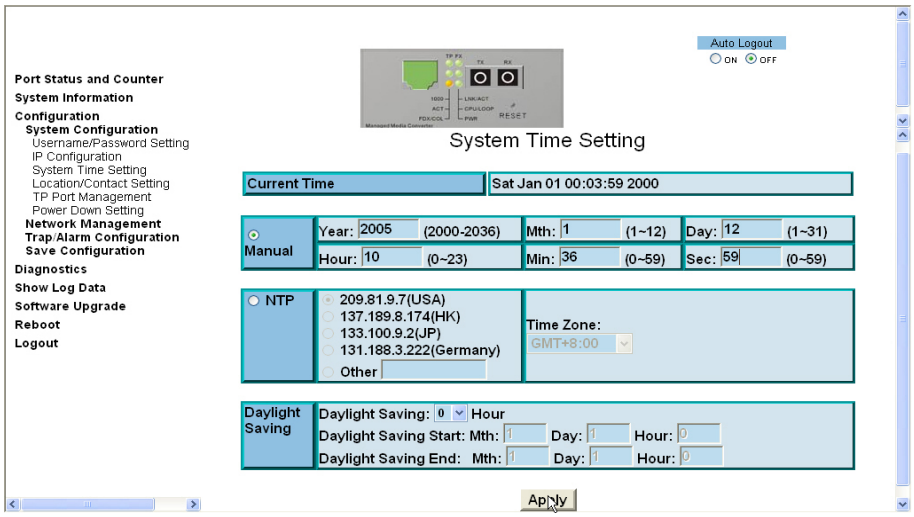


Fig. 3-8

3-4-1-4. Location/Contact Setting

Function name:

Location/Contact Setting

Function description:

The Location and Contact fields could be filled some information for network manager's reference. The location field could be filled in the device location information. Thus, the device maintainer could find out this device easily. The contact field could be filled in the device maintainer information e.g. name, phone number, etc.. It is easy for the network manager to contact the device maintainer.

Parameter description:

Location:

The location field could be filled in the device location information with any visual characters. The default setting is empty. User-defined.

Contact:

The contact field could be filled in the device maintainer information with any visual characters. The default setting is empty. User-defined.

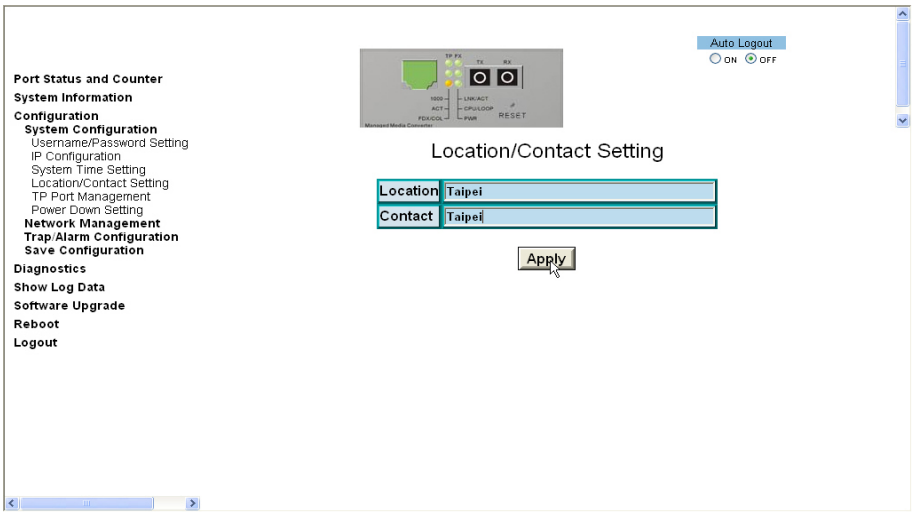


Fig. 3-9

3-4-1-5. TP Port Management

Function name:

TP Port Management

Function description:

This TP Port Management design is concerning security enhanced. This remote converter should be put on CPE site in general application, thus the TP port is connected to network of customer. There are many attack issue possible enter from TP port to effect the RC-2201/02 managed function. To isolate the traffics with managed RC-2201/02 request from TP port when the TP port management is disabled.

Parameter description:

Disable:

To isolate the traffics with managed RC-2201/02 request from TP port when the TP port management was set to “Disabled”.

Enable:

Allow the traffics with managed RC-2201/02 request from TP port when the TP port management was set to “Enabled”.

Default: Enable

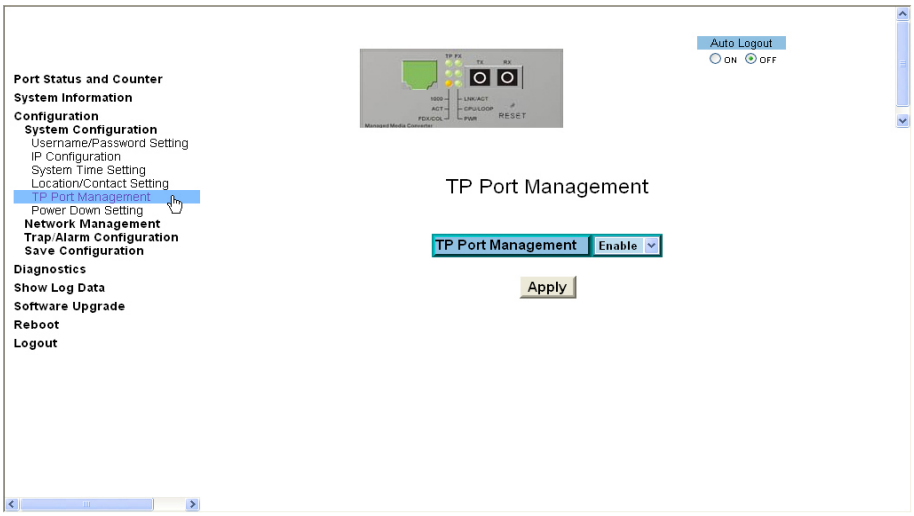


Fig. 3-10

3-4-1-6. Power Down Setting

Function name:

Power Down Setting

Function description:

This design is concerning for system safety. This function will detect two things: the temperature if over 60°C, the cooling fan if failed. If these two conditions happened at the same time and the "Power Down Setting" was enabled, the RC-2201/02 will power down automatically.

Parameter description:

Disable:

If this function is disabled, the RC-2201/02 will keep working regardless of the temperature was over 60°C and the cooling fan failed at the same time.

Enable:

In this status, the RC-2201/02 will power down automatically while the temperature was over 60°C and the cooling fan failed at the same time.

Default: Enable

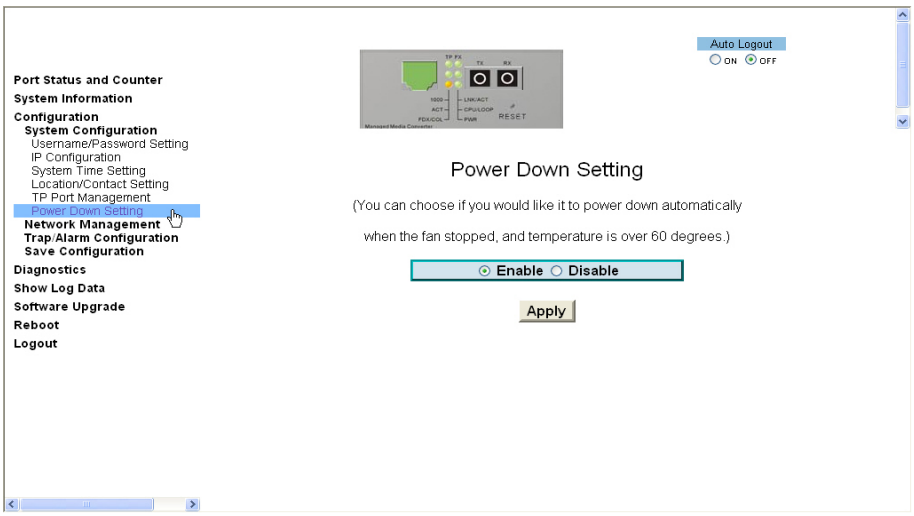


Fig. 3-11

3-4-2. SNMP Configuration

Function name:

SNMP Configuration

Function description:

Any Network Management running the Simple Network Management Protocol (SNMP) can manage the converter equipped with SNMP agent, provided that the Management Information Base (MIB) is installed correctly on the management station. The SNMP is a protocol that is used to govern the transfer of information between SNMP manager and agent. The SNMP agent is running on the converter if you set the SNMP "Enable". If the SNMP is set "Disable", the related Community Name, Trap Host IP Address, Trap and RMON counters will be ignored.

In the SNMP Configuration function, the community string is used as a password to authenticate the request. If both have the same community name, they can talk each other; otherwise, network management unit cannot access the converter via SNMP protocol. To set up a trap host means to create a trap manager by assigning an IP address to host the trap message. In other words, the trap host is a network management unit with SNMP manager receiving the trap message from the converter with SNMP agent issuing the trap message. 4 trap hosts can prevent the important trap message from losing.

A SNMP manager must pass the authentication, then it can access the agent. So, both parties must have the same community name. You can also define the system name, system location and contact person for easy management via SNMP manager. Fill in the data, then click **<Apply>** button to apply new settings.

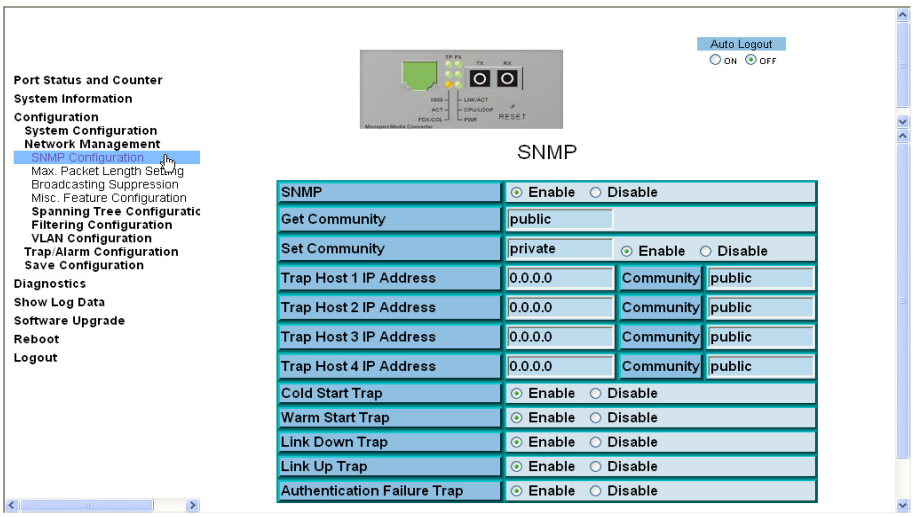


Fig. 3-12

Parameter description:

SNMP

SNMP enable/disable selection. Default is “Enable”.

Get Community:

User-definable community name for the authentication of SNMP Get community, the default is “public”.

Set Community:

User-definable community name for the authentication of SNMP Set community, the default is “private”.

Trap Host 1 IP Address:

To set up a trap host IP address in order to receive RC-2201/02’s trap message. The default host 1 IP address “0.0.0.0” means that the transmission of trap message to host 1 is disabled.

Community: (Host 1)

User-definable community name for the authentication of SNMP Trap community for host 1, the default is “public”.

Trap Host 2 IP Address:

This parameter setting is the same as “Trap Host 1 IP Address”.

Community: (Host 2)

This parameter setting is the same as “Community (Host 1)”. The default is “public”.

Trap Host 3 IP Address:

This parameter setting is the same as “Trap Host 1 IP Address”.

Community: (Host 3)

This parameter setting is the same as “Community (Host 1)”. The default is “public”.

Trap Host 4 IP Address:

This parameter setting is the same as “Trap Host 1 IP Address”.

Community: (Host 4)

This parameter setting is the same as “Community (Host 1)”. The default is “public”.

Cold Start Trap:

This trap packet will be sent while RC-2201/02 Converter's power is cycling.

Warm Start Trap:

This trap packet will be sent while rebooting RC-2201/02 Converter by means of pressing the RC-2201/02's RESET button or running Reboot function of software.

Link Down Trap:

This trap packet will be sent while the RC-2201/02 Converter's UTP link status is changed from up to down. The Link Down Trap Packet will not be sent while RC-2201/02 Converter's fiber port link status is changed from up to down. The fiber port Link Down Event will be stored in Log Data.

Link Up Trap:

This trap packet will be sent while the RC-2201/02 Converter's UTP or Fiber port link status is changed from down to up.

Authentication Failure Trap:

This trap packet will be sent while the RC-2201/02 SNMP agent authentication failure occurs. Authentication failure means that SNMP agent receives a SNMP request with error community name.

3-4-3. Max. Packet Length Setting

RC-2201/02 provides two levels of Ethernet frame size for the user to set up. One is 1536 bytes and the other is 1522 bytes. After selecting one of these two options and then pressing **<Apply>** button, the setting will take effect immediately. Default setting is 1522 bytes long which can afford accommodating the size of the tagged VLAN frame.

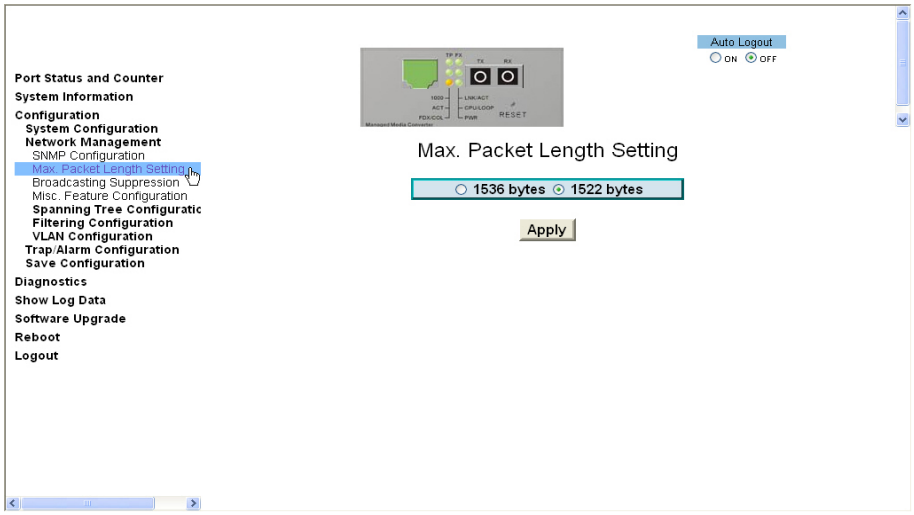


Fig. 3-13

3-4-4. Broadcasting Suppression

Function name:

Broadcasting Suppression

Function description:

The Broadcasting Suppression function is used to spread the request broadcast packet into a bigger time frame to prevent the traffic congestion due to broadcast packets from many network devices which may seek its NMS, boot server, DHCP server and many connections predefined when the whole building or block loses the power and then reboot and recover. At this moment, a bunch of converter or other network device on the LAN will try its best to find the server to get the services or try to set up the predefined links, they will issue many broadcast packets in the network.

RC-2201/02 supports a random delay time for DHCP and boot delay for each device. This suppresses the broadcast storm while all devices are at booting stage in the same time. The maximum user-defined delay time is 30 sec. If Broadcasting Suppression function is enabled, the delay time is set randomly, ranging from 0 to 30 seconds, because the exactly delay time is computed by the converter itself. The default is “Disable”.

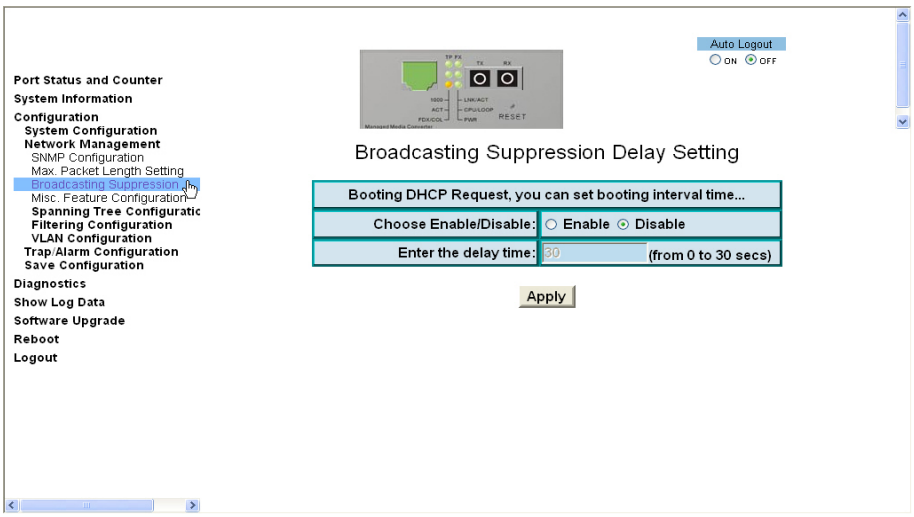


Fig. 3-14

3-4-5. Misc. Feature Configuration

Miscellaneous Feature Configuration gathers many functions, including MAC Address Aging Time Setting, Broadcast Storm Filter Limit, Priority Queue Service, Max. bridge transmit delay bound control and QoS Policy in a page, which cannot be categorized to some function type. They are described below.

Function Name:

MAC Address Aging Time Setting

Function Description:

This function is used to set the MAC Address Age-out Time applied to the whole MAC address table except some static MAC address. The range of MAC table address entry age-out time is from 30, 33, 36,…765 seconds.

If a source node has not visited the converter for a time longer than the Age-out Time, its responded MAC address information in the converter's MAC table will be marked invalid by the converter's aging function. This age-out rule will not be applied to the static MAC addresses.

The default age-out time is 300 seconds.

Function Name:

Broadcast Storm Filter Limit

Function Description:

Broadcast Storm Filter Limit is applied to filter the converter's broadcast traffic. If you choose an upper threshold, it is enabled. It is a global function. The setting will be applied to all ports of the converter.

The threshold is the percentage of the port's total bandwidth used by broadcast traffic. When broadcast traffic for a port rises above the threshold you set, broadcast storm filter discards the extra broadcast traffic. This keeps the total broadcast traffic less than the threshold able to be forwarded and limits too many broadcast packet running over the network. RC-2201/02 supports five threshold values, including 5%, 10%, 15%, 20%, and 25%.

Default is OFF.

Function name:

Priority Queue Service

Function Description:

RC-2201/02 provides three priority queue services for transmission scheduling, including FCFS, strict priority and WRR. It is a global function.

First Come First Service (FCFS): All incoming packets will be sent out upon the sequence of packet's arrival order.

All High before Low: After all high priority packets are sent out, then low ones are sent in turn.

Weighted Round Robin (WRR): This is actually a transmission ratio of high priority packet and low priority packet. If you would like to repeatedly send 5 high priority packets first and then 2 low priority packets. You can set a 5 to high weight field and a 2 to low weight field in WRR function row. The WRR Default Setting High = 2, Low = 1

Function name:

Max. bridge transmit delay bound control

Function description:

To set the time that the packets can reside in the queue of the converter.

Parameter description:

Max. bridge transmit delay bound control:

The function "Maximum bridge transmit delay bound control" is applied to limit the maximum queuing time of the packets in the converter. If enabled, the packets queued over the time set will be dropped. Valid values are 1 sec., 2 sec., 4 sec. and OFF. Default value is OFF.

Enable Delay Bound:

Limit the resided time of the low priority packets in the converter. If the low priority packet is not transmitted out and time set by "Delay bound" is enabled, the packet will be dropped. The valid delay time is 1 – 255 ms and OFF. Default Max. Delay Time is 1ms.

NOTE: Make sure that "Max. bridge transmit delay bound control" is enabled before enabling Delay Bound, because Enable Delay Bound must work under "Max. bridge transmit delay bound control is enabled".

Function name:

QoS Policy

Function Description:

It is used to assign which priority level is high or low. Normally, we map the priority levels 7 – 4 to be high priority and the priority levels 3 – 0 to be low priority. The mapped priority will be applied to the forwarding scheduler. In RC-2201/02, it is FCFS, Strict and WRR. The QoS policy is global.

Default: If enabled, priority levels 7 – 4 are assigned to be high priority, and priority levels 3 – 0 are assigned to be low priority.

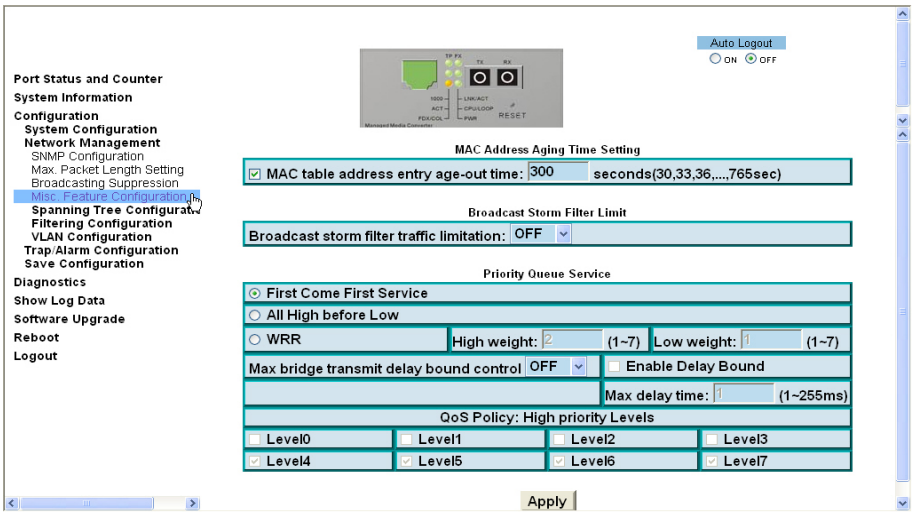


Fig. 3-15

3-4-6. Spanning Tree Configuration

The Spanning Tree Protocol (STP) is a standardized method (IEEE 802.1D) for avoiding loops in switched networks. When STP is enabled, ensure that only one path is active between any two nodes on the network at a time. User can enable Spanning Tree Protocol on converter's web management and then set up other advanced items. We recommend that you enable STP on all converters to ensure a single active path on the network.

3-4-6-1. STP Status

Function name:

STP Status

Function description:

In the Spanning Tree Status, user can read 12 parameters to know STP current status. The 12 parameters' description is listed in the following table.

Parameter description:

STP Status:

Show the current STP Enabled / Disabled status. Default is "Disabled".

Bridge ID:

Show converter's bridge ID which stands for the MAC address of this converter.

Bridge Priority:

Show this converter's current bridge priority setting. Default is 32768.

Designated Root:

Show root bridge ID of this network segment. If this converter is a root bridge, the "Designated Root" will show this converter's bridge ID.

Designated Priority:

Show the current root bridge priority.

Root Port:

Show port number connected to root bridge with the lowest path cost.

Root Path Cost:

Show the path cost between the root port and the designated port of the root bridge.

Current Max. Age:

Show the current root bridge maximum age time. Maximum age time is used to monitor if STP topology needs to change. When a bridge does not receive a hello message from root bridge until the maximum age time is counted down to 0, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges.

All bridges in the LAN will re-learn and determine which the root bridge is. Maximum Age time is assigned by root bridge in unit of seconds. Default is 20 seconds.

Current Forward Delay:

Show the current root bridge forward delay time. The value of Forward Delay time is set by root. The Forward Delay time is defined as the time spent from Listening state moved to Learning state or from Learning state moved to Forwarding state of a port in bridge.

Hello Time:

Show the current hello time of the root bridge. Hello time is a time interval specified by root bridge, used to request all other bridges periodically sending hello message every “hello time” seconds to the bridge attached to its designated port.

Topology Change Count:

STP Topology Change Count expresses the time spent in unit of seconds since the beginning of the Spanning Tree Topology Change to the end of the STP convergence. Once the STP change is converged, the Topology Change count will be reset to 0. The figures showing in the screen may not be the exact time it spent but very close to, because the time is eclipsing.

Time Since Last Topology Change:

Time Since Last Topology Change is the accumulated time in unit of seconds the STP has been since the last STP Topology Change was made. When Topology Change is initiated again, this counter will be reset to 0. And it will also count again once STP topology Change is completed.

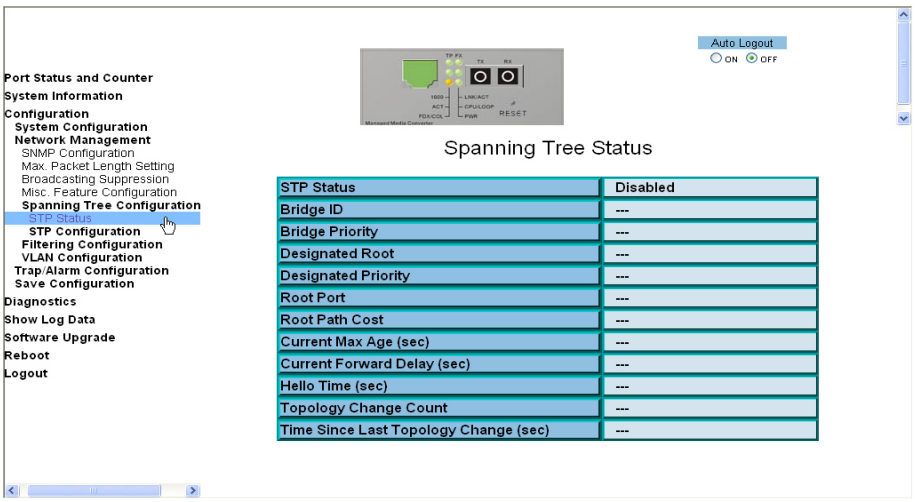


Fig. 3-16

3-4-6-2. STP Configuration

The STP, Spanning Tree Protocol, actually includes RSTP. In the Spanning Tree Configuration, there are six parameters open for the user to configure as user's idea. Each parameter description is listed below.

Function name:

STP State Setting

Function description:

User can set the following Spanning Tree parameters to control STP function enable/disable, select mode RSTP/STP and affect STP state machine behavior to send BPDU in this converter. The default setting of Spanning Tree Protocol is "Disable".

Parameter description:

Spanning Tree Protocol:

Set 802.1W Rapid STP function Enable / Disable. Default is "Disable"

Bridge Priority:

The lower the bridge priority is, the higher priority it has. Usually, the bridge with the highest bridge priority is the root. If you want to have RC-2201/02 as root bridge, you can set this value lower than that of bridge in the LAN. The valid value is 0 ~ 61440. The default is 32768.

Hello Time:

Hello Time is used to determine the periodic time to send normal BPDU from designated ports among bridges. It decides how long a bridge should send this message to other bridge to tell I am alive. When RC-2201/02 is the root bridge of the LAN, for example, all other bridges will use the hello time assigned by RC-2201/02 to communicate with each other. The valid value is 1 ~ 10 in unit of second.

Default is 2 seconds.

Max. Age:

When RC-2201/02 is the root bridge, the whole LAN will apply this figure set by RC-2201/02 as their maximum age time. When a bridge received a BPDU originated from the root bridge and if the message age conveyed in the BPDU exceeds the Max. Age of the root bridge, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-calculate and determine who the root bridge is. The valid value of Max. Age is 6 ~ 40 seconds. Default is 20 seconds.

Forward Delay:

You can set the root bridge forward delay time. This figure is set by root bridge only. The forward delay time is defined as the time spent from Listening state moved to Learning state and also from Learning state moved to Forwarding state of a port in bridge. The forward delay time contains two states, Listening state to Learning state and Learning state to Forwarding state. It assumes that forward delay time is 15 seconds, then total forward delay time will be 30 seconds. This has much to do with the STP convergent time which will be more than 30 seconds because some other factors.

The valid value is 4 ~ 30 seconds, default is 15 seconds.

Force Version:

Two options are offered for the user's choosing STP algorithm. One is RSTP and the other is STP. If STP is chosen, RSTP will run as a legacy STP. RC-2201/02 supports RSTP (802.1w) which is backward compatible with STP (802.1d).

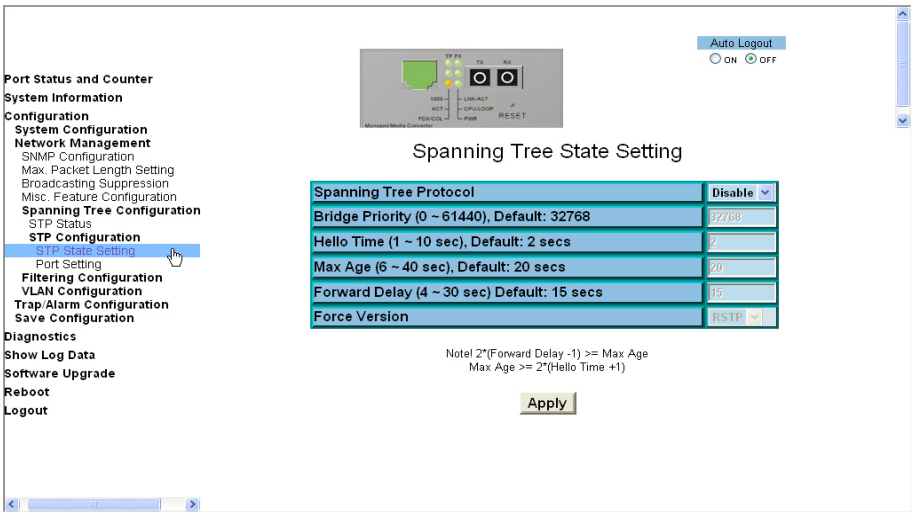


Fig. 3-17

Function name:

Port Setting

Function description:

In the STP Port Setting, one item selection and five parameters settings are offered for user's setup. User can disable and enable each port by selecting each Port Status item. User also can set "Path Cost" and "Priority" of each port by filling in the desired value and set "Admin Edge Port" and "Admin Point To Point" by selecting the desired item.

Parameter description:

Port Status:

It displays the current state of a port. We cannot manually set it because it displays the status only. There are three possible states. (according to 802.1w specification)

- DISCARDING state indicates that this port can neither forward packets nor contribute learning knowledge.

Notice: Three other states (Disable state, BLOCKING state and LISTENING state) defined in the 802.1d specification are now all represented as DISCARDING state.

- LEARNING state indicates this port can now contribute its learning knowledge but cannot forward packets still.

- FORWARDING state indicates this port can both contribute its learning knowledge and forward packets normally.

Path Costs:

The contribution value of the path through this port to Root Bridge. STP algorithm determines a best path to Root Bridge by calculating the sum of path cost contributed by all ports on this path. A port with a smaller path cost value would become the Root Port more possibly. The range is 0 – 200,000,000. In RC-2201/02, path cost with 0 value means automatic which will automatically assign the path cost value defined by IEEE 802.1w. Default: 0

802.1w RSTP recommended value: (Valid range: 1 – 200,000,000)
10 Mbps : 2,000,000
100 Mbps : 200,000
1 Gbps : 20,000

Priority:

Priority here means Port Priority. Port Priority and Port Number are mixed to form the Port ID. Port IDs are often compared in order to determine which port of a bridge would become the Root Port. The range is 0 – 240. Default is 128.

Admin Edge Port:

If user selects “Yes”, this port will be an edge port. An Edge Port is a port connected to a device that knows nothing about STP or RSTP. Usually, the connected device is an end station. Edge Ports will immediately transit to forwarding state. User can select “Yes” or “No”. Default: No

Admin Point To Point:

We say a port is on a point-to-point link if the port is in full-duplex mode. RSTP fast convergence can only happen on a point-to-point link. To determine if this port is on a point-to-point link is by auto-detecting the port’s duplex mode if the parameter is set to “Auto”. If the parameter is set “True”, the port is unconditionally considered to be on a point-to-point link. If the parameter is set to “False”, fast transition to Forwarding state will not happen on this port. User can select “Auto”, “True” or “False”. Default: Auto

M Check:

Migration Check. It forces the port sending out an RSTP BPDU instead of a legacy STP BPDU at the next transmission. The only benefit of this operation is to make the port quickly get back to act as an RSTP port. Click **<M Check>** button to send a RSTP BPDU from the port you specified.

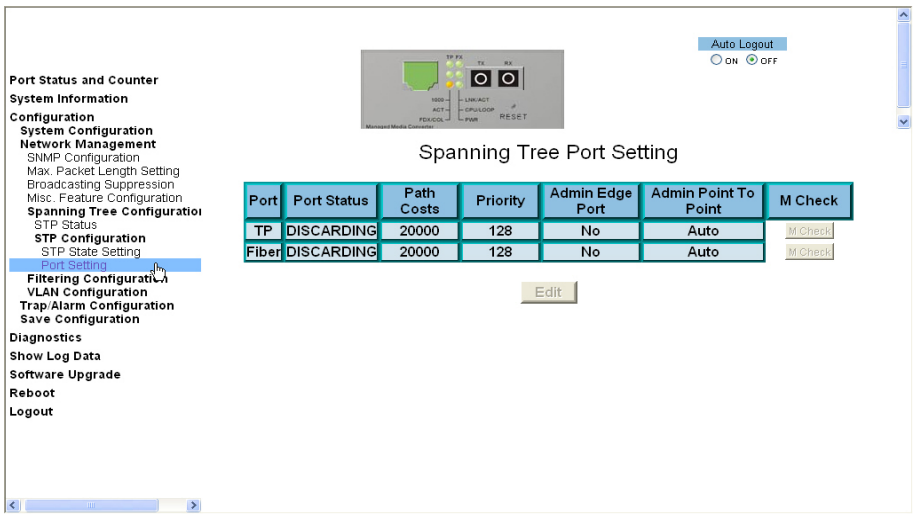


Fig. 3-18

3-4-7. Filtering Configuration

The filtering function in RC-2201/02 is used to filter unwanted MAC address from accessing the converter based on some simple rules. RC-2201/02 provides three types of filtering function for security configuration. They are Allowed Forwarding MAC Address, Port Security Setting and Denied Forwarding MAC Address. You can configure it for different purposes of application. Here we list two examples for your reference.

Example 1:

Assumes administrator wishes a specified station can only access the converter from a specified port and the traffic from all other stations is rejected by that specified port. How should we configure RC-2201/02 for the case?

Solution:

First, enter the function “Allowed Forwarding MAC Address” to add an entry with the MAC address of the specified station on the Allowed Forwarding table of the specified port. The Security Port of the specified port should be then enabled in the “Port Security Setting” function. Finishing this process, the specified port will not allow any other station to access the converter except the specified station. And if this specified station is moved to other port, it cannot access the converter, either.

Example 2:

Assumes an administrator wishes to deny a specified station from accessing the converter, which is to isolate the specified station from the converter. How should we configure RC-2201/02 for the case?

Solution:

For denying a specified station, it is easy. You just have to use the function “Denied Forwarding MAC Address” to configure it. Enter this function and press the **<Add>** button to add the MAC address of the specified station, which is rejected to access the converter. The Deny Forwarding function is global. It is applied to the whole converter.

Function name:

Allowed Forwarding MAC Address

Function description:

Allowed Forwarding MAC Address is a function to allow the user in the Allowed Forwarding table to access a specified port of the converter. Allowed Forwarding table associated with a specified port of a converter is setup by manually inputting MAC address and its alias name. The data in the table is kept until RC-2201/02 is powered off. The traffic with the source MAC address listed in the Allowed Forwarding Table can only access the converter from the port associated. The MAC address associated with the specified port cannot access any other port of the converter. All of the above settings will take effect only when "Port Security Setting" function of the associated port is enabled.

For adding a MAC address entry in the allowed table, you just need to fill in three parameters: MAC address, associated port, and priority. Just select the MAC address entry you want and click **<Delete>** button, you also can remove it.

Parameter description:

Allowed Forwarding Table:

A table stored MAC address entry with associated port and priority, is used to provide the function to allow the users listed in this table to access the associated port of the converter.

MAC Address:

It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 - 01

Port:

Ports of RC-2201/02.

Priority:

This is for traffic priority. User can configure a MAC address high priority or low priority. If MAC address is configured high priority, the packet with that DA or SA will be put into the high priority queue and be transmitted with high priority. If MAC address is configured low priority, the packet with that MAC address will be transmitted with low priority.

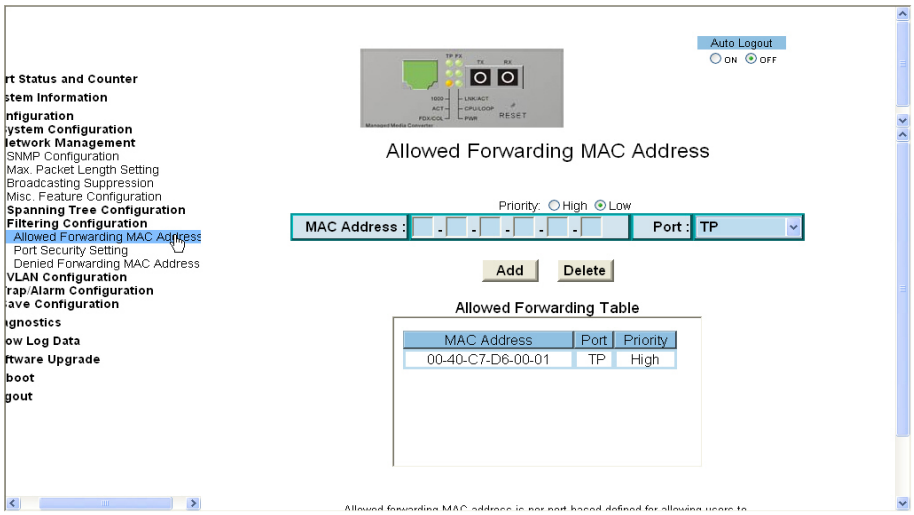


Fig. 3-19

Function name:

Port Security Setting

Function description:

The usage of Port Security has to combine with Allowed Forwarding MAC Address function as mentioned above. In this function, you can enable it if you select the port. If the user ticks each port, then, the ticked port will stop learning MAC Address and block any incoming packet except that the packet with the MAC Address is listed in the Forwarding MAC Address table associated with that port. The **<Apply>** button is for user to click to let the system take effect immediately.

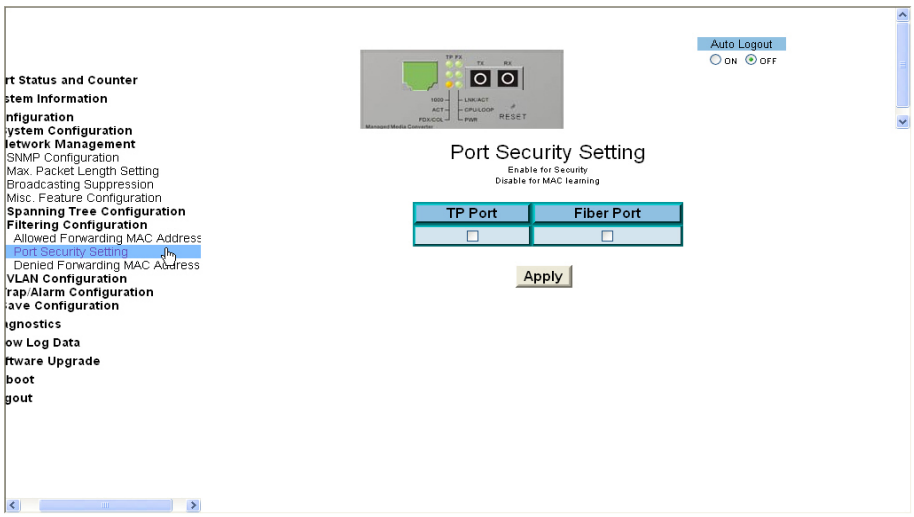


Fig. 3-20

Function name:

Denied Forwarding MAC Address

Function description:

Denied Forwarding MAC Address is a function that denies the packet forwarding if the packet's MAC Address is listed in the filtering MAC Address table. User can very easily maintain the table by filling in MAC Address field individually. User also can insert or delete each entry by clicking **<Add>** or **<Delete>** button.

Parameter description:

Denied Forwarding Table:

A table stored MAC address entry is used to provide the function to reject the users listed in this table to access the converter.

MAC Address:

It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 - 01

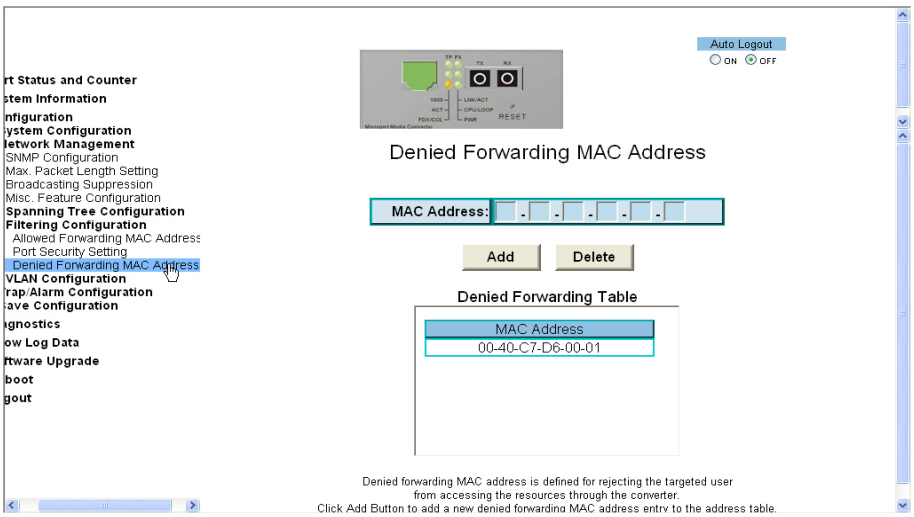


Fig. 3-21

3-4-8. VLAN Configuration

VLAN configuration is used to partition your LAN into small ones as your demand. Properly configuring it, you can gain not only improving security and increasing performance but greatly reducing VLAN management.

RC-2201/02 supports Tag-based VLAN (802.1q) as well as protocol VLAN (802.1v). Tag-based VLAN (802.1q) also associates with GVRP for the management of dynamic tag-based VLAN. You can make VLAN configurations via the function VLAN Enable/Disable (VLAN State Setting) and VLAN Port VID Setting to configure VLAN parameters in the web user interface.

Function name:

VLAN Enable/Disable (VLAN State Setting)

Function description:

The VLAN State Setting function includes two modes: Disable and Enable, you can choose one of them by pulling down the list and pressing the **<Downward>** arrow key. Then, click **<Apply>** button, the settings will take affect immediately.

Parameter description:

VLAN Mode:

Disable:

Stop VLAN function on RC-2201/02. In this mode, no VLAN is applied to RC-2201/02. This is the default setting.

Enable:

Effect VLAN function on RC-2201/02. In this mode, VLAN is applied to RC-2201/02.

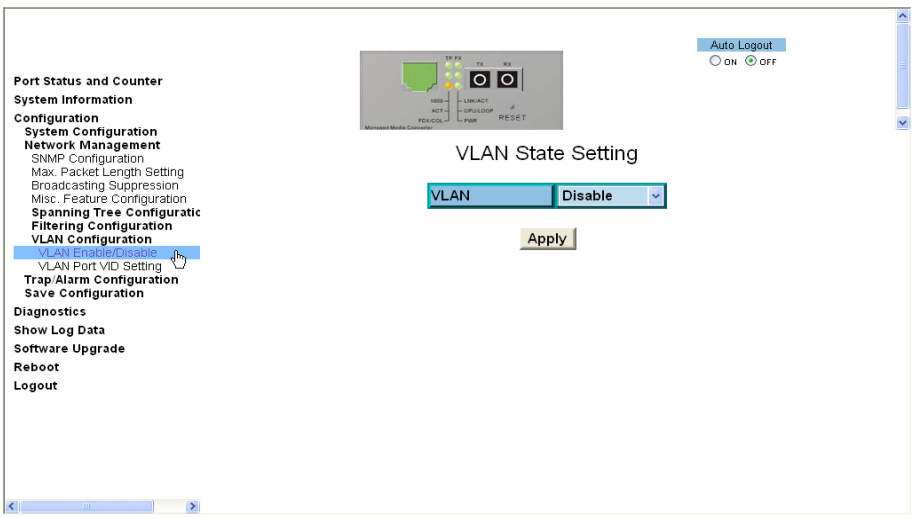


Fig. 3-22 VLAN State Setting

Function name:

VLAN Port VID Setting (for Tag Only)

Function description:

This design is concerning the CPE site customer, there are not VLAN aware network device for tagged based VLAN application. The RC-2201/02 plays the role of the edge of VLAN aware network with tagged packets for upstream and untagged for downstream.

Parameter description:

Port:

Port of RC-2201/02.

PVID:

In VLAN Port VID Setting, user can input VID number to each port. The range of VID is from 1 to 4094.

Default: 1

Tag:

The egress rule configuration is to make decision for packets tagging out or packets un-tagging out from the configured port.

Default: Untag

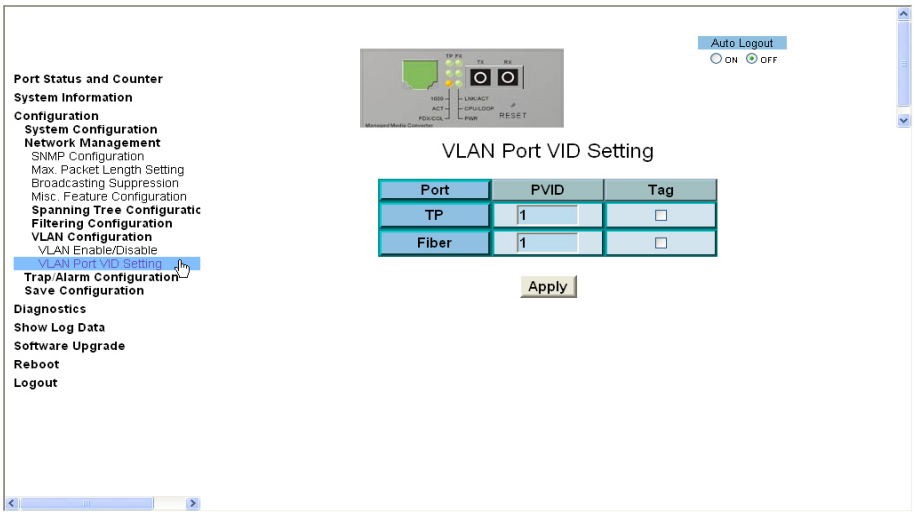


Fig. 3-23 VLAN Port VID Setting

3-4-9. Trap/Alarm Configuration

Function name:

Trap Events Configuration

Function description:

The Trap Events Configuration function is used to enable the Managed Media Converter to send out the trap information while pre-defined trap events occurred. RC-2201/02 offers 16 different trap events to users for converter management. The trap information can be sent out in three ways, including e-mail, mobile phone SMS (short message system) and Trap. The message will be sent while users tick (☑) the trap event individually on the web page shown as below.

Fig. 3-24

Parameter description:

STP Topology Changed: E-mail, SMS and Trap

E-mail : Send “STP Topology Changed” alarm message by E-mail when the STP topology changed event happened. Default: Unchecked (☐)

SMS : Send “STP Topology Changed” alarm message by Short Message System when the STP topology changed event happened. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the STP topology changed event happened. Default: Checked (☑)

STP Disabled: E-mail, SMS and Trap

E-mail : Send “STP Disabled” alarm message by E-mail when the STP function was disabled.
Default: Unchecked (☐)

SMS : Send “STP Disabled” alarm message by Short Message System when the STP function was disabled.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the STP function was disabled.
Default: Unchecked (☐)

STP Enabled: E-mail, SMS and Trap

E-mail : Send “STP Enabled” alarm message by E-mail when the STP function was enabled.
Default: Unchecked (☐)

SMS : Send “STP Enabled” alarm message by Short Message System when the STP function was enabled.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the STP function was enabled.
Default: Unchecked (☐)

Temperature Abnormal: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS when the RC-2201/02’s case inside temperature was over 50°C or under 4°C. The default setting is shown as below:

E-mail : Send “Temperature Abnormal” alarm message by E-mail when the case inside temperature was over 52°C or under 4°C. Default: Unchecked (☐)

SMS : Send “Temperature Abnormal” alarm message by Short Message System when the case inside temperature was over 52°C or under 4°C. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the case inside temperature was over 52°C or under 4°C.
Default: Checked (☑)

Temperature Normal: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS when the RC-2201/02's case inside temperature recovered from (over 52°C or under 4°C) to under (48°C and over 4°C). The default setting is shown as below:

E-mail : Send "Temperature Normal" alarm message by E-mail when the case inside temperature recovered to normal status. Default: Unchecked (☐)

SMS : Send "Temperature Normal" alarm message by Short Message System when the case inside temperature recovered to normal status. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the case inside temperature recovered to normal status. Default: Checked (☑)

Case Opened: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS when the RC-2201/02's case was opened. The default setting is shown as below:

E-mail : Send "Case Opened" alarm message by E-mail when case is opened. Default: Unchecked (☐)

SMS : Send "Case Opened" alarm message by Short Message System when case is opened. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when case is opened. Default: Checked (☑)

Case Closed: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS when the RC-2201/02's case was closed. The default setting is shown as below:

E-mail : Do not send "Case Closed" alarm message by E-mail when case is closed. Default: Unchecked (☐)

SMS : Do not send "Case Closed" alarm message by Short Message System when case is closed. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when case is closed. Default: Checked (☑)

Flash Write Fail: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device happened “Flash Write Fail” event.
Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device happened “Flash Write Fail” event.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device happened “Flash Write Fail” event.
Default: Checked (☑)

FAN Abnormal: E-mail, SMS and Trap

E-mail : Send “FAN Abnormal” alarm message by E-mail when the FAN was abnormal. Default: Unchecked (☐)

SMS : Send “FAN Abnormal” alarm message by Short Message System when the FAN was abnormal.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the FAN was abnormal. Default: Checked (☑)

FAN Normal: E-mail, SMS and Trap

E-mail : Send “FAN Normal” alarm message by E-mail when the FAN was normal. Default: Unchecked (☐)

SMS : Send “FAN Normal” alarm message by Short Message System when the FAN was normal. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the FAN was normal. Default: Checked (☑)

FAN/Temperature Fail: E-mail, SMS and Trap

E-mail : Send “FAN/Temperature Fail” alarm message by E-mail when the FAN was abnormal and Temperature was over 60°C at the same time. Default: Unchecked (☐)

SMS : Send “FAN/Temperature Fail” alarm message by Short Message System when the FAN was abnormal and Temperature was over 60°C at the same time.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the FAN was abnormal and Temperature was over 60°C at the same time. Default: Checked (☑)

Cold Start: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device happened restart event by cold booting method.
Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device happened restart event by cold booting method.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device happen restarted event by cold booting method.
Default: Checked (☑)

Warm Start: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device happened restart event by warm booting method.
Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when he device happened restart event by warm booting method.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when he device happened restart event by warm booting method.
Default: Checked (☑)

Link Down: E-mail, SMS and Trap

Default setting is as below:

E-mail : Send alarm message by E-mail when the device Ethernet port happened link down event.
Default: Unchecked (☐)

SMS : Send short message to mobile phone when the device Ethernet port happened link down event.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device Ethernet port happened link down event.
Default: Checked (☑)

Link Up: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device Ethernet port happened link up event. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device Ethernet port happened link up event. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device Ethernet port happened link up event. Default: Checked (☑)

Authentication Failure: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device received a SNMP get or set request with a wrong community name. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device received a SNMP get or set request with a wrong community name. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device received a SNMP get or set request with a wrong community name. Default: Checked (☑)

Function name:

Alarm Configuration

Function description:

Alarm configuration is used to configure the persons who should receive the alarm message via either email or SMS, or both. It depends on your settings. An email address or a mobile phone number has to be set in the web page of alarm configuration (See Fig.3-25). Then, user can read the trap information from the email or the mobile phone. This function provides 6 email addresses and 6 mobile phone numbers at most. The 16 different trap events will be sent out to SNMP Manager when trap event occurs. After ticking trap events, you can fill in your desired email addresses and mobile phone numbers. Then, please click **<Apply>** button to complete the alarm configuration. It will take effect in a few seconds.

Note: SMS may not work in your mobile phone system. It is customized for different systems.

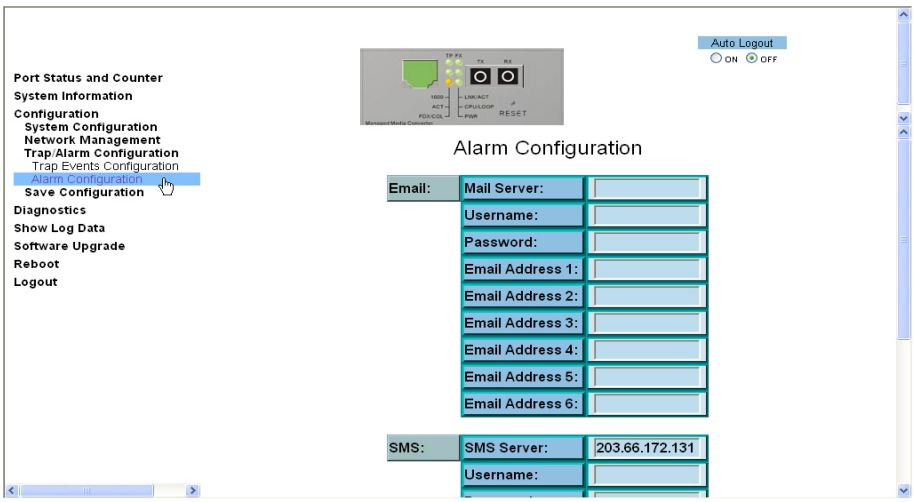


Fig. 3-25

Parameter description:

Email:

Mail Server: the IP address of the server transferring your email.

Username: your username on the mail server.

Password: your password on the mail server.

Email Address 1 – 6: email address that would like to receive the alarm message.

SMS:

SMS Server: the IP address of the server transferring your SMS.

Default: 203.66.172.131

Username: your username in ISP.

Password: your username in ISP.

Mobile Phone 1-6: the mobile phone number that would like to receive the alarm message.

3-4-10. Save Configuration

RC-2201/02 supports three copies of configuration, including default configuration, working configuration and user configuration for your configuration management. All of them are listed and described below respectively.

- **Default Configuration:**

  This is the ex-factory setting and cannot be altered.

- **Working Configuration:**

  It is the configuration you are using currently and can be changed any time. The configurations you are using are saved into this configuration file. This is updated each time as you press **<Apply>** button.

- **User Configuration:**

  It is the configuration file for the specified or backup purposes and can be updated while having confirmed the configuration. You can retrieve it by performing Restore User Configuration.

Function name:

Save As User Configuration

Function description:

Save As User Configuration function can save the current configuration as a user configuration file in flash memory.

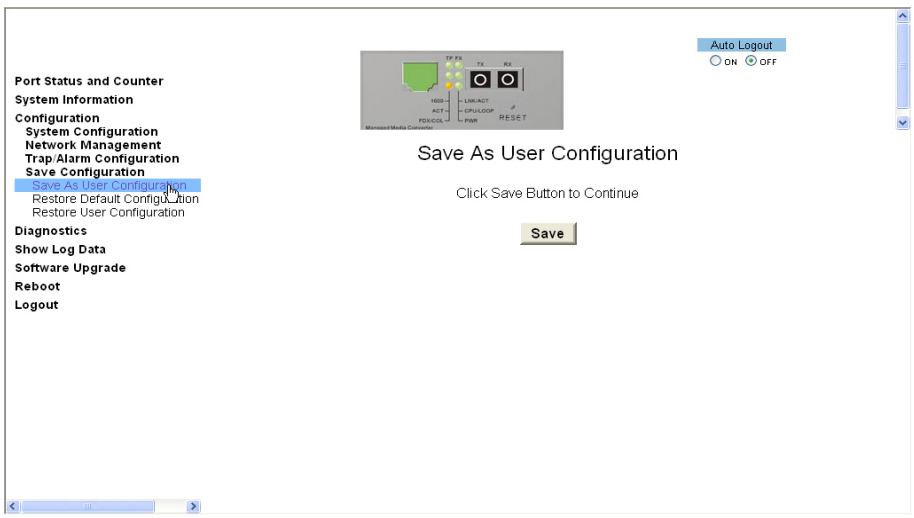


Fig. 3-26

Function name:

Restore Default Configuration

Function description:

Restore Default Configuration function can retrieve the ex-factory setting to replace the working configuration.

Fig. 3-27

Function name:

Restore User Configuration

Function description:

Restore User Configuration function can retrieve the previous confirmed working configuration stored in the flash memory to update user's current working configuration. When completing to restore the configuration, the system's working configuration is updated and will be changed its working mode by the new configuration immediately.

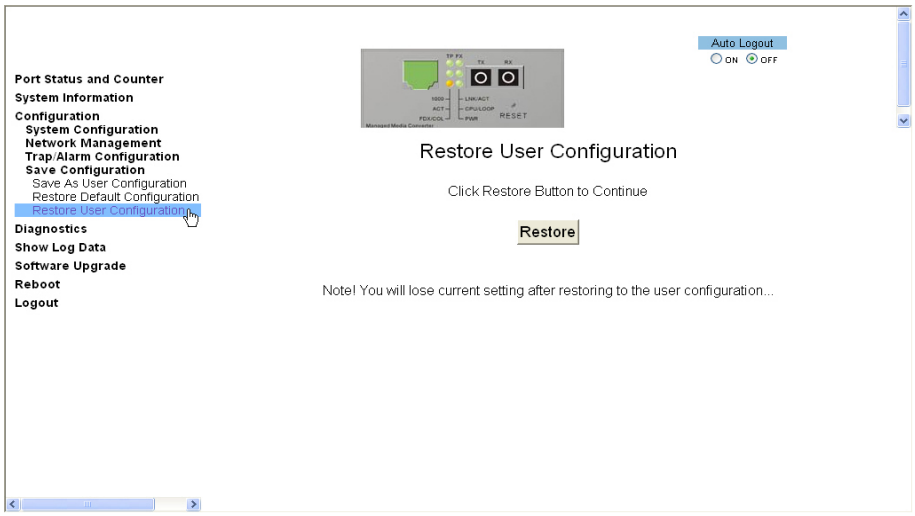


Fig. 3-28

3-5. Diagnostics

Function name:

Diagnostics

Function description:

Diagnostics function provides a set of basic system diagnosis. It let users know that whether the system is health or needs to be fixed. The basic system check includes UART test, DRAM test, Flash test, Temperature detection, Case detection and Fan RPM detection.

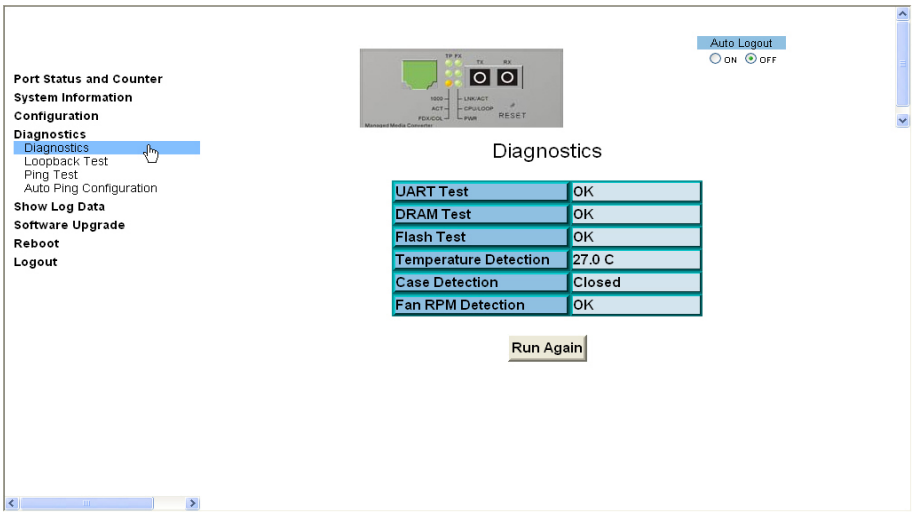


Fig. 3-29

Function name:

Loopback Test

Function description:

In the Loopback Test function, there are two different loopback tests. One is Internal Loopback Test and the other is External Loopback Test. The former test function will not send the test signal outside the RC-2201/02 converter box. The test signal only wraps around in the RC-2201/02 converter box. As to the latter test function, it will send the test signal to its link partner. If you do not have them connected to active network devices, i.e. the ports are link down, RC-2201/02 will report the port numbers failed. If they all are ok, it just shows OK.

Note: Whatever you choose Internal Loopback Test or External Loopback Test, these two functions will interfere with the normal system working, and all packets in sending and receiving also will stop temporarily.

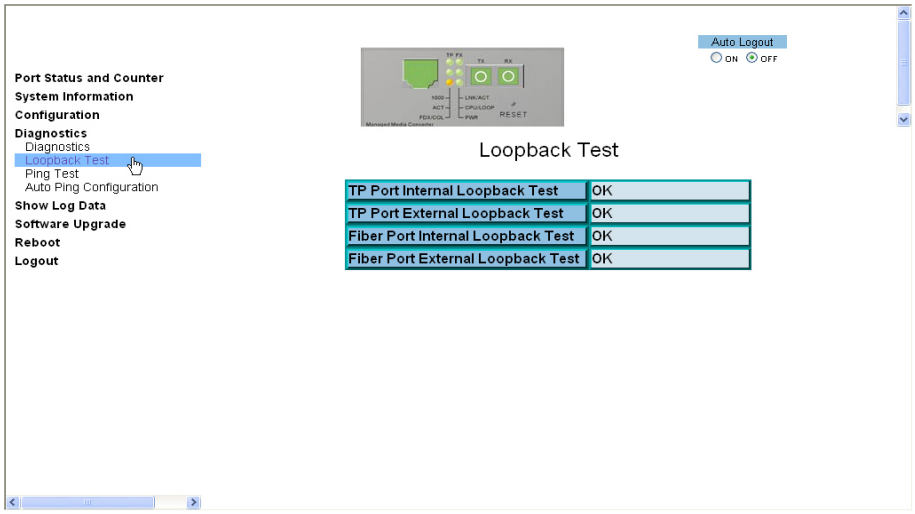


Fig. 3-30

Function name: Ping Test

Function description:

Ping Test function is a tool for detecting if the target device is alive or not through ICMP protocol which abounds with report messages. RC-2201/02 provides Ping Test function to let you know that if the target device is available or not. You can simply fill in a known IP address and then click **<Ping Now>** button. After a few seconds later, RC-2201/02 will report you the pinged device is alive or dead.

Parameter description:

IP Address: an IP address with the version of v4, e.g. 192.168.1.1.

Default Gateway: IP address of the default gateway.

For more details, please see the section of IP address in Chapter 2.

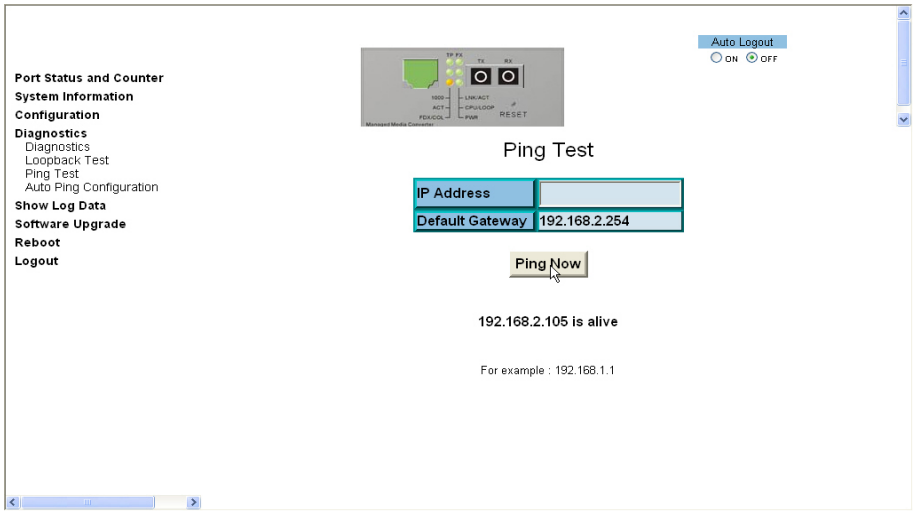


Fig. 3-31

Function name:

Auto Ping Configuration

Function description:

Auto Ping Configuration is used to test one or two target devices periodically with a period of time, which is programmable. This can detect that if the target device or the device itself is dead, and it helps you debug the network problems. RC-2201/02 can auto-ping two network devices at the same time.

Parameter description:

Ping Interval:

This parameter is used to instruct RC-2201/02 periodically pinging the target device with the time interval you assigned. Programmable time range: 1 – 60 minutes. Default: 10 minutes.

Host IP Address 1/2 and Current Default Gateway:

These are IP addresses with the format of version 4. For more information, please see the section of IP address in Chapter 2.

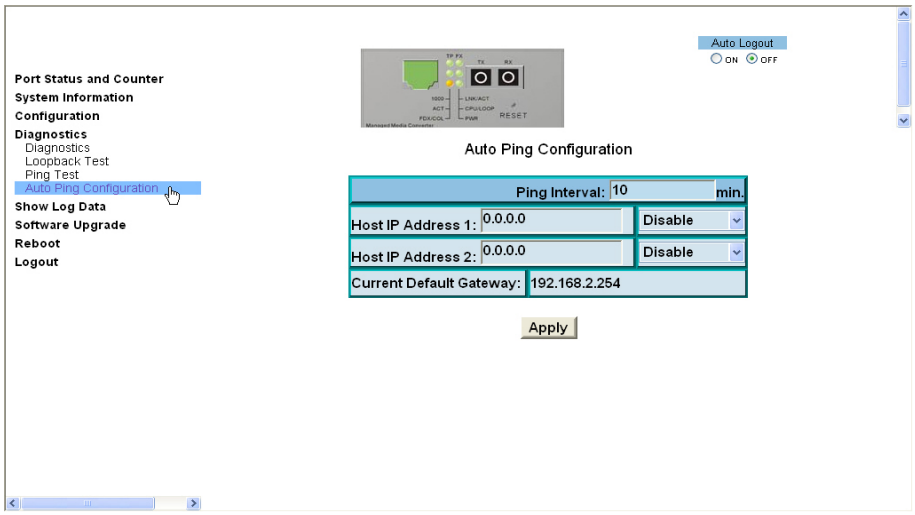


Fig. 3-32

3-6. Show Log Data

This function shows the log data. RC-2201/02 provides one type of trap log data for users. There are 11 private trap logs and 5 public trap logs. RC-2201/02 supports total 120 log entries. For more details on log items, please refer to the section of Trap/Alarm Configuration and SNMP Configuration. User logs include user login and logout.

Function name:

Trap Log Data

Function description:

The Trap Log Data is displaying the log items including all SNMP Private Trap events, SNMP Public traps and user logs occurred in the system. In the report table, No, Time and Events are three fields contained in each trap record.

Parameter description:

No:

Display the order number that the trap happened.

Time:

Display the time that the trap happened.

Events:

Display the trap event name.

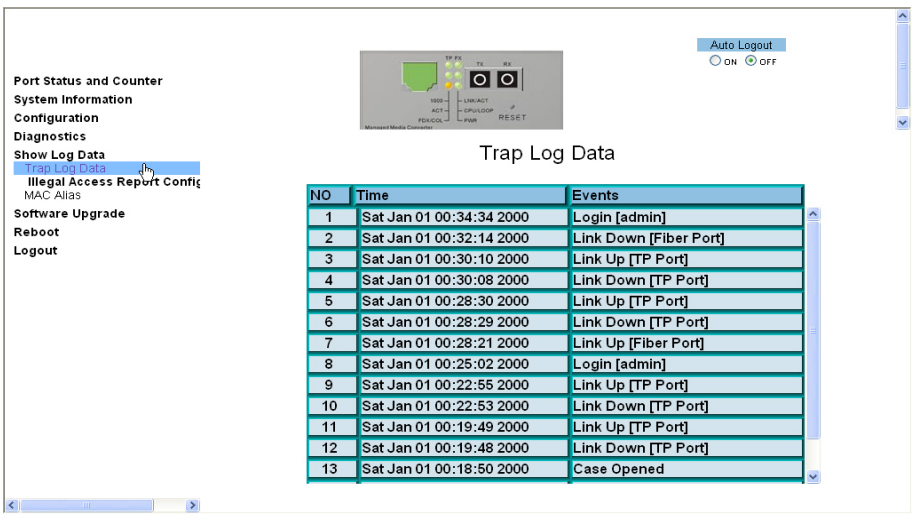

Auto Logout
ON OFF
Port Status and Counter
System Information
Configuration
Diagnostics
Show Log Data
Trap Log Data
Illegal Access Report Config
MAC Alias
Software Upgrade
Reboot
Logout
RESET
Trap Log Data
NO Time Events
1 Sat Jan 01 00:34:34 2000 Login [admin]
2 Sat Jan 01 00:32:14 2000 Link Down [Fiber Port]
3 Sat Jan 01 00:30:10 2000 Link Up [TP Port]
4 Sat Jan 01 00:30:08 2000 Link Down [TP Port]
5 Sat Jan 01 00:28:30 2000 Link Up [TP Port]
6 Sat Jan 01 00:28:29 2000 Link Down [TP Port]
7 Sat Jan 01 00:28:21 2000 Link Up [Fiber Port]
8 Sat Jan 01 00:25:02 2000 Login [admin]
9 Sat Jan 01 00:22:55 2000 Link Up [TP Port]
10 Sat Jan 01 00:22:53 2000 Link Down [TP Port]
11 Sat Jan 01 00:19:49 2000 Link Up [TP Port]
12 Sat Jan 01 00:19:48 2000 Link Down [TP Port]
13 Sat Jan 01 00:18:50 2000 Case Opened

Fig. 3-33

Function name:

Illegal Access Report Status

Function description:

User can select “Enable” or Disable” the illegal access report function. If select disabled illegal access report, the illegal access report will not log any illegal access events. If select enabled illegal access report, the illegal access events will be logged.

Parameter description:

Illegal Access Report Status:

You can enable/disable the mode of illegal access report.

Default: Enable.

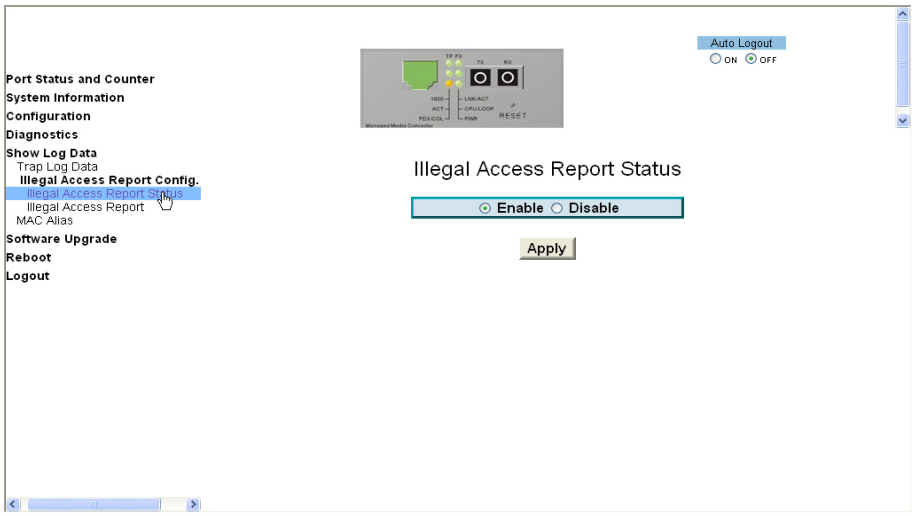


Fig. 3-34

Function name:

Illegal Access Report

Function description:

The Illegal Access Report function is to display the unauthorized users accessing RC-2201/02. If Allowed forwarding or Denied forwarding was configured, Illegal Access Report starts recording which illegal user(s) try to access. At this moment, illegal users will be rejected to serve in RC-2201/02. This can highly improve network security and traffic management.

In this table, RC-2201/02 records those users who violate Allowed Forwarding rule and Denied Forwarding rule. Besides, illegal access report can also show the alias name of users, instead of MAC address only, if you configured MAC alias name in advance.

Each entry in illegal access report comprises six fields, including record order number, Source Address, Destination Address, port, time and type. RC-2201/02 supports 32 record entries for illegal access report by applying ring structure. That means if there is no room for the new record, it will overwrite the oldest record in the ring.

Parameter description:

No.: Display the order number that the trap happened.

Source Address: MAC Source Address.

Dest. Address: MAC Destination Address.

Port: Display the port that the illegal access happened.

Time: Current System Time.

Type: Violating Allowed Table or Violating Denied Table.

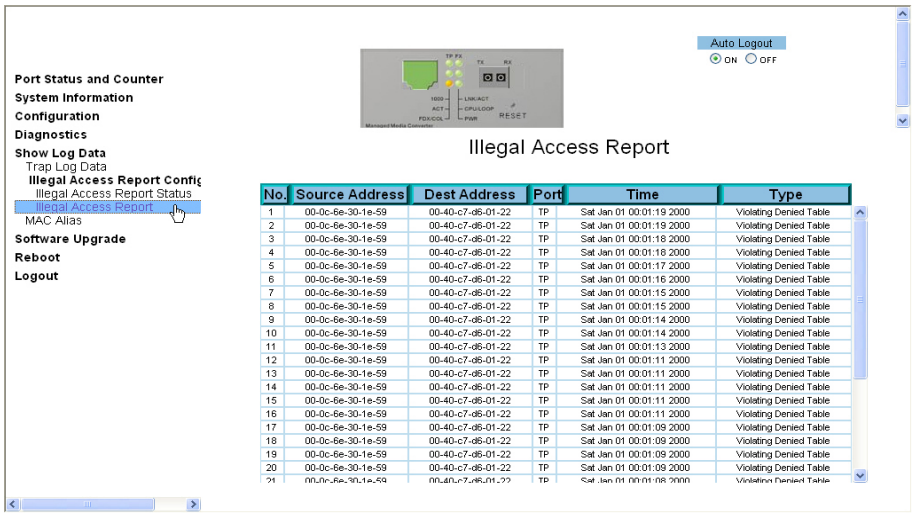

Auto Logout
ON OFF
Port Status and Counter
System Information
Configuration
Diagnostics
Show Log Data
Trap Log Data
Illegal Access Report Config
Illegal Access Report Status
Illegal Access Report
MAC Alias
Software Upgrade
Reboot
Logout
Illegal Access Report
No. Source Address Dest Address Port Time Type
1 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:19 2000 Violating Denied Table
2 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:19 2000 Violating Denied Table
3 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:18 2000 Violating Denied Table
4 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:18 2000 Violating Denied Table
5 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:17 2000 Violating Denied Table
6 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:16 2000 Violating Denied Table
7 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:15 2000 Violating Denied Table
8 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:15 2000 Violating Denied Table
9 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:14 2000 Violating Denied Table
10 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:14 2000 Violating Denied Table
11 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:13 2000 Violating Denied Table
12 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:11 2000 Violating Denied Table
13 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:11 2000 Violating Denied Table
14 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:11 2000 Violating Denied Table
15 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:11 2000 Violating Denied Table
16 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:11 2000 Violating Denied Table
17 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:09 2000 Violating Denied Table
18 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:09 2000 Violating Denied Table
19 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:09 2000 Violating Denied Table
20 00-0c-6e-30-1e-59 00-40-c7-d6-01-22 TP Sat Jan 01 00:01:09 2000 Violating Denied Table

Fig. 3-35 Illegal Access Report

Function name:

MAC Alias

Function description:

MAC Alias function is used to let you assign MAC address a plain English name, which will help you tell which MAC address belongs to which user in the illegal access report. At the initial time, it shows all pairs of the existed alias name and MAC address.

There are three MAC alias functions in this function folder, including MAC Alias Add, MAC Alias Edit and MAC Alias Delete. You can click **<Create>** button to add a new alias name for a specified MAC address, or mark an existed entry to edit/delete it. Alias name must be composed of A-Z, a-z and 0-9 only and has a maximal length of 17 characters.

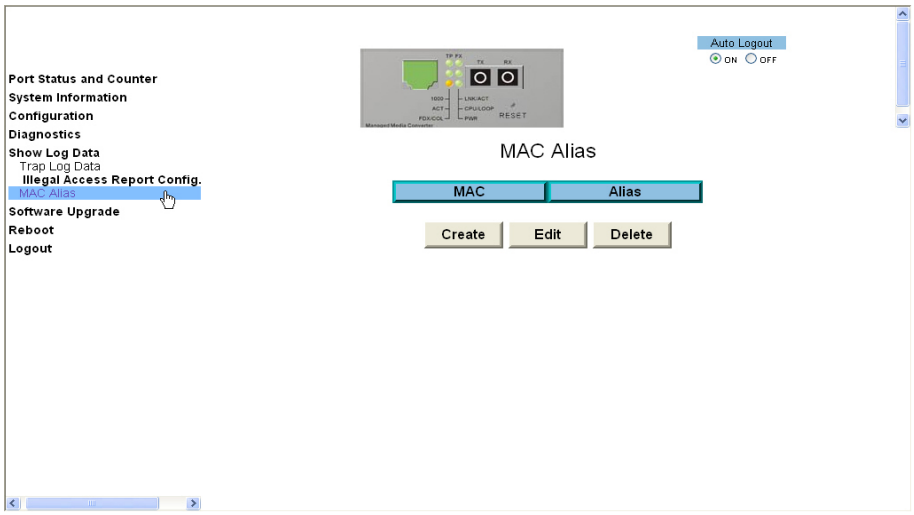


Fig. 3-36 MAC Alias

Function name:

MAC Alias Add

Function description:

In the MAC Alias function, it is used to let you add an association between MAC address and a plain English name. User can click **<Create>** button to add a new record with name.

Parameter description:

MAC Address:

New Entry:

If you want to apply a name to a MAC address which does not exist in the MAC address table, you must choose New Entry to fill in the MAC address by yourself or select a MAC address in the pull-down menu by pressing the **<Downward>** arrow key. You can also select one of the MAC addresses in the list, and then assign it an alias name for mnemonic name.

MAC Alias:

MAC alias name you assign.

Note: If there are too many MAC addresses learned in the table, we recommend you inputting the MAC address and alias name directly.

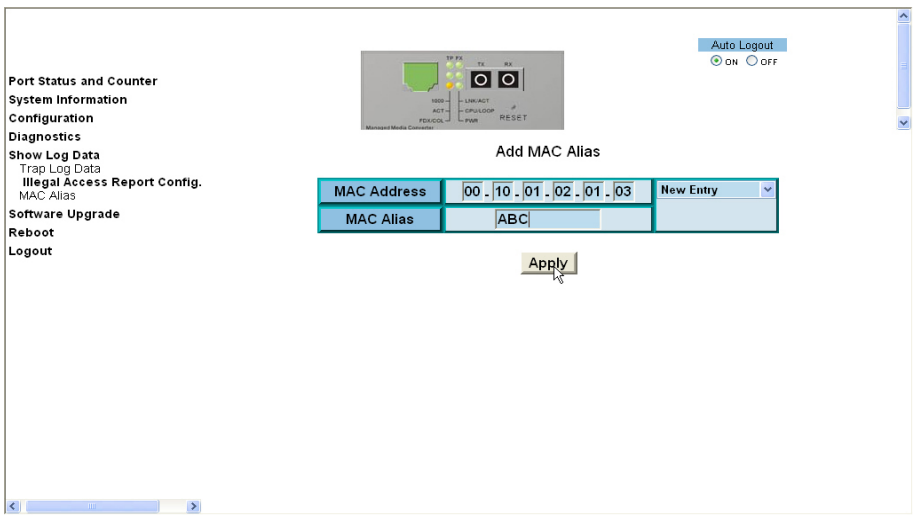


Fig. 3-37 Add MAC Alias

Function name:

MAC Alias Edit/Delete

Function description:

MAC Alias Edit/Delete function is used to let you modify/remove an alias name to a MAC address. You can select an existed MAC address or alias name to modify/remove.

Parameter description:

MAC Address:

The Ethernet MAC address of end station.

MAC Alias:

A mnemonic name for the end station.

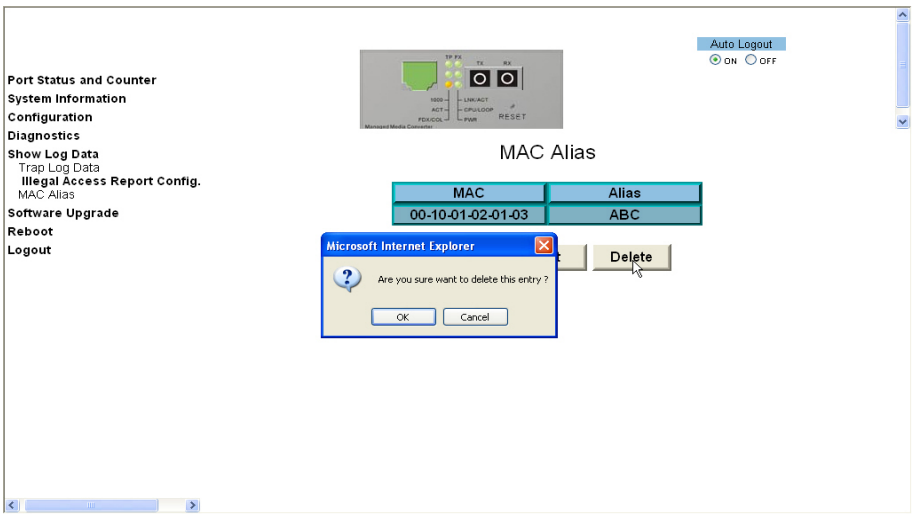


Fig. 3-38 Delete MAC Alias

3-7. Software Upgrade

Software upgrade tool is used to help upgrade the software function in order to fix or improve the function. RC-2201/02 provides a TFTP client for software upgrade. This can be done through Ethernet. For more details about upgrade procedures, please refer to Appendix D.

Function name:

Software Upgrade

Function description:

RC-2201/02 supports TFTP upgrade tool for upgrading software. If you assure to upgrade software to a newer version one, you must follow two procedures:

1.) Specifying the IP address where TFTP server locates. In this field, the IP address of your TFTP server should be filled in.

2.) Specifying what the filename and where the file is. You must specify full path and filename.

Once you press **<Apply>** button, RC-2201/02 will prompt the screen for you to reconfirm. Then, RC-2201/02 starts downloading software from TFTP server if you choose **<OK>** button. It will be just back to "Software Upgrade" if you choose **<Cancel>** button. If your download is not successful, RC-2201/02 will also be back to "Software Upgrade", and it will not upgrade the software as well.

When download is completed, RC-2201/02 starts upgrading software. A reboot message will be prompted after completing upgrading software. At this time, you must reboot RC-2201/02 to have new software worked.

Note: Software upgrade is hazardous if power is off. You must do it carefully.

Parameter description:

TFTP Server: A TFTP server stored the image file you want to upgrade.

Path and Filename: File path and filename stored the image file you want to upgrade.

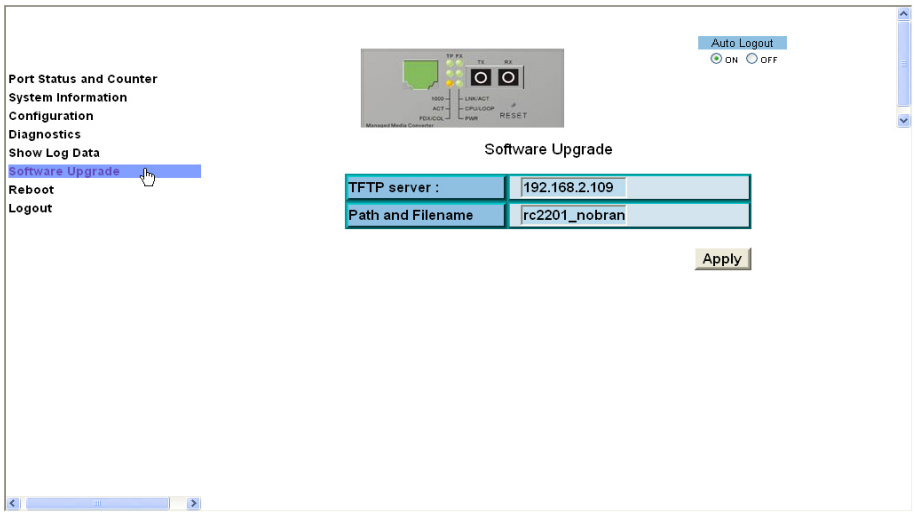


Fig. 3-39

3-8. Reboot

We offer you many ways to reboot RC-2201/02, including power up, hardware reset and software reset. You can press the RESET button in the front panel to reset RC-2201/02. After upgrading software, changing IP configuration or changing VLAN mode configuration, then you must reboot to have the new configuration taken effect. Here we are discussing is software reset for the “reboot” in the main menu.

Function name:

Reboot

Function description:

Reboot RC-2201/02. Reboot takes the same effect as the RESET button on the front panel of RC-2201/02 converter. It will take around thirty (30) seconds to complete the system boot.

Fig. 3-40

3-9. Logout

You can manually logout by performing Logout function. In RC-2201/02, it provides another way to logout. You can configure it to logout automatically.

Function name:

Logout

Function description:

RC-2201/02 allows you to logout the system to prevent other users from the system without the permission. If you do not logout and exit the browser, RC-2201/02 will automatically have you logout. Besides this manually logout and implicit logout, you can click **<Auto Logout>** radian at the right-top corner to explicitly ON/OFF this logout function.

Parameter description:

Auto Logout:

Select On/OFF. Default is ON. If it is "ON", and no action and no key is stroke as well in any function screen more than 3 minutes, RC-2201/02 will have you logout automatically.

Fig. 3-41

4. Operation of Menu-driven Console

1. The Managed Media Converter RC-2201/02 also provides a text-based menu-driven console by RS-232 terminal or Ethernet Port (telnet) to manage and monitor the port activity. Usually, in order to have the device connected to the management station, the console is used to change the settings such as IP address for the first time. For the detailed connection steps, please refer to the Section 2-2-3 in Chapter 2.

   Now, you can use the console to modify the IP setting through telnet program.

   The default values of RC-2201/02 converter are as follows:

IP Address	:192.168.1.1
Subnet Mask	:255.255.255.0
Default Gateway	:192.168.1.254
Username	:admin
Password	:admin

2. For instance, you can run telnet 192.168.1.1 in Windows 95/98/2000/XP…, and so on, then, enter the username and password as above. The screen is shown as follows:

Fig. 4-1

4-1. Text-based Menu-driven Management Overview

The text-based main menu will be shown up after you fill in “admin” to serve as username as well as password and press the **<Enter>** key. On the menu, user can use arrow keys to move cursor to each item and press the **<Enter>** key to select the item you would like. The **<Esc>** key is used to escape to the upper menu page layer.

The main functions will be listed in the middle of console. The main functions contain “Port Status and Counter”, “System Information”, “Configuration”, “Diagnostics”, “Show Log Data”, “Software Upgrade”, “Reboot” and “Logout”. The details of the main functions will be introduced in the following sections.

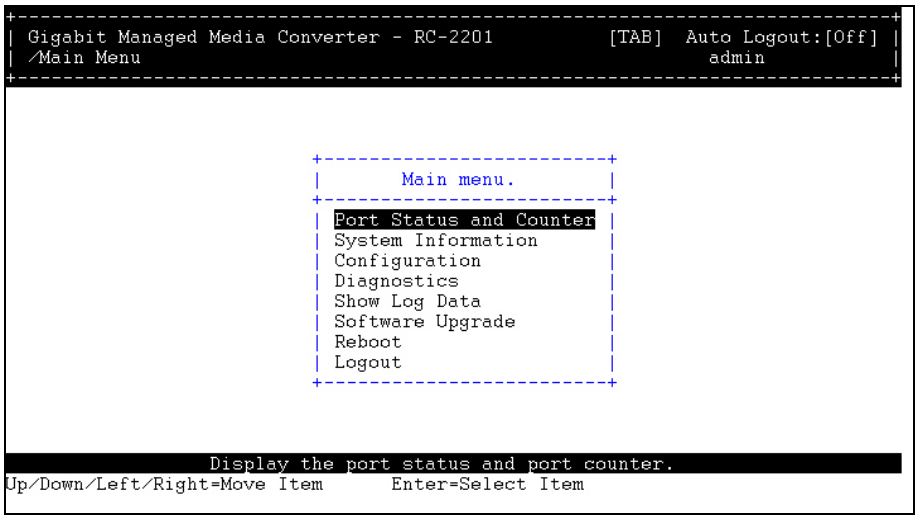


Fig. 4-2

Function name:

System Information

Function description:

Show the basic system information.

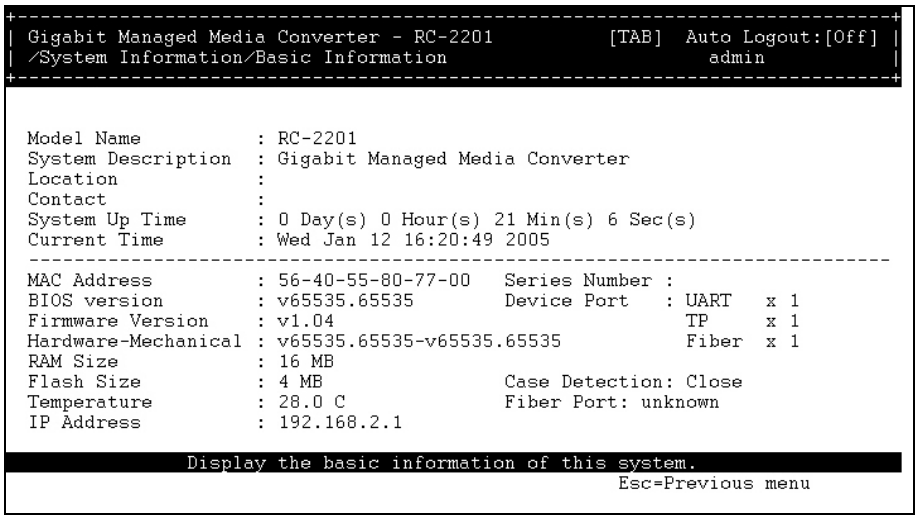

Gigabit Managed Media Converter - RC-2201 [TAB] Auto Logout:[Off]
/System Information/Basic Information admin
Model Name : RC-2201
System Description : Gigabit Managed Media Converter
Location :
Contact :
System Up Time : 0 Day(s) 0 Hour(s) 21 Min(s) 6 Sec(s)
Current Time : Wed Jan 12 16:20:49 2005
MAC Address : 56-40-55-80-77-00 Series Number :
BIOS version : v65535.65535 Device Port : UART x 1
Firmware Version : v1.04 TP x 1
Hardware-Mechanical : v65535.65535-v65535.65535 Fiber x 1
RAM Size : 16 MB
Flash Size : 4 MB Case Detection: Close
Temperature : 28.0 C Fiber Port: unknown
IP Address : 192.168.2.1
Display the basic information of this system.
Esc=Previous menu

Fig. 4-3

Parameter description:

Model Name:

The model name of this product.

System Description:

Managed Media Converter

Location:

Basically, it is the location where this converter is put. User-defined.

Contact:

Basically, it is the contact window in charge of the maintenance of this converter. User-defined.

System Up Time:

The time accumulated since this converter is powered up. Its format is day, hour, minute, second.

Current Time:

Show the system time of RC-2201/02. Its format: day of week, month, day, hours : minutes : seconds, year. For instance, Wed, Apr. 06, 12:10:10, 2004.

MAC Address:

It is the MAC address of the management agent in this converter.

BIOS Version:

The version of the BIOS in this converter.

Firmware Version:

The firmware version in this converter.

Hardware-Mechanical:

The version of Hardware and Mechanical. The figure before the hyphen is the version of electronic hardware; the one after the hyphen is the version of mechanical.

RAM Size:

The size of the DRAM in this converter.

Flash Size:

The size of the flash memory in this converter.

Series Number:

The serial number is assigned by manufacturer.

Device Port:

Show all types and numbers of the port. In RC-2201/02, there are one serial port, one TP port and one FX port.

Temperature:

The air temperature inside of this converter.

IP Address:

The IP address that indicates where RC-2201/02 is located (e.g. default IP address of RC-2201/02 is 192.168.1.1).

Case Detection:

Show the status of the upper case of this converter. When the case is lid off, it shows “Open”; otherwise, it shows “Close”.

Fiber Port:

Show the connector type (e.g. SC/LC), fiber mode (e.g. Single/Multi mode) status and number of fiber port.

4-2. The Function Tree in Console Management

For offering you a clear guide to use this Managed Media Converter, the following is the whole function tree of RC-2201/02 in console management. User can refer to the following sections based on the order of this function tree below for more details.

- **Port Status and Counter**
  - Port Current Status
  - Port Counters
  - Port Configuration
- **System Information**
- **Configuration**
  - System Configuration
    - Create Username/Password
    - Change Username/Password
    - IP Configuration
    - System Time Setting
    - Location/Contact Setting
    - TP Port Management
    - Power Down Setting
  - Network Management
    - SNMP Configuration
    - Packet Length
    - Broadcasting Suppression
    - Spanning Tree Configuration
    - Misc. Feature Configuration
    - Filtering Configuration
    - VLAN Configuration
  - Trap/Alarm Configuration
    - Trap Events Configuration
    - Alarm Configuration
  - Save Configuration
    - Save As User Configuration
    - Restore Default Configuration
    - Restore User Configuration

- **Diagnostics**
  - Diagnostics
  - Loopback Test
  - Ping Test
  - Auto Ping Configuration
- **Show Log Data**
  - Trap Log Data
  - Illegal Access Report
    - Enable/Disable
    - Display Illegal Access Report
  - Mac Alias
- **Software Upgrade**
- **Reboot**
- **Logout**

4-3. Port Status and Counter

Function name:

Port Current Status

Function description:

Display the current port status of RC-2201/02.

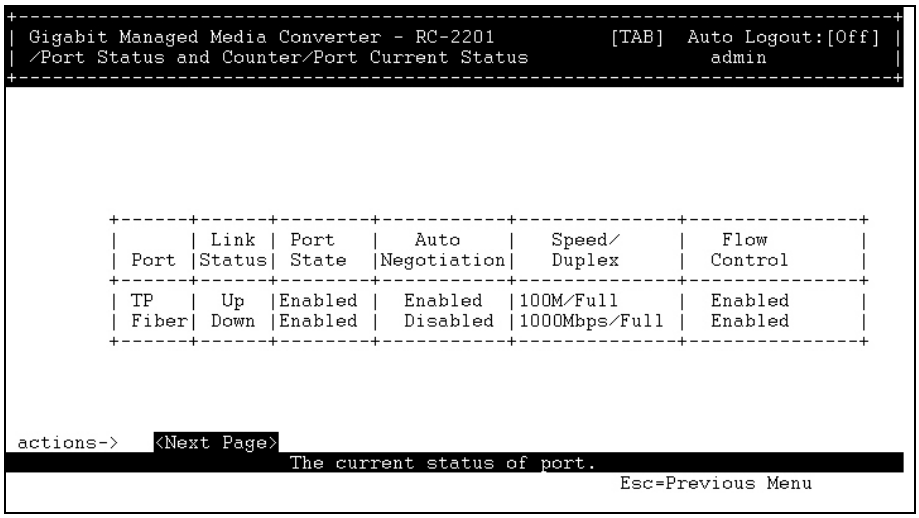

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Port Status and Counter/Port Current Status
admin
Port | Link Status | Port State | Auto Negotiation | Speed/ Duplex | Flow Control
TP | Up | Enabled | Enabled | 100M/Full | Enabled
Fiber | Down | Enabled | Disabled | 1000Mbps/Full | Enabled
actions-> <Next Page>
The current status of port.
Esc=Previous Menu

Fig. 4-4

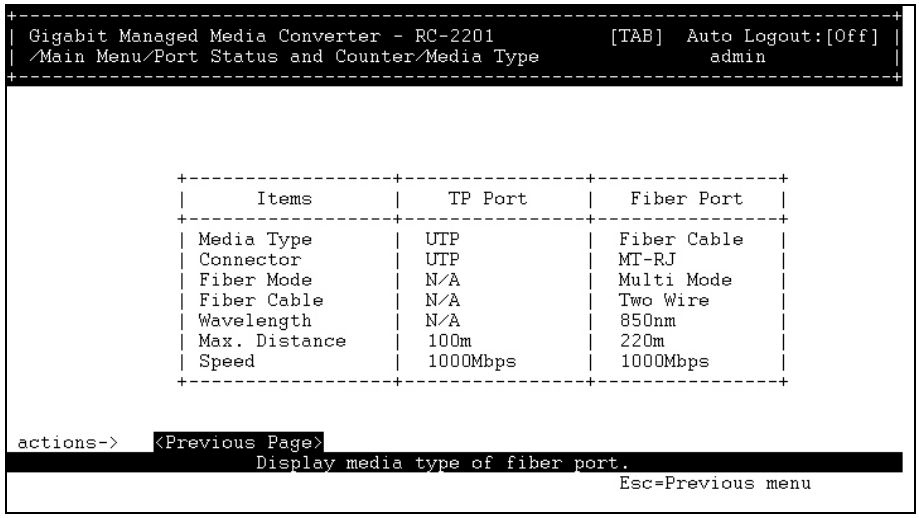

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Main Menu/Port Status and Counter/Media Type
admin
Items | TP Port | Fiber Port
Media Type | UTP | Fiber Cable
Connector | UTP | MT-RJ
Fiber Mode | N/A | Multi Mode
Fiber Cable | N/A | Two Wire
Wavelength | N/A | 850nm
Max. Distance | 100m | 220m
Speed | 1000Mbps | 1000Mbps
actions-> <Previous Page>
Display media type of fiber port.
Esc=Previous menu

Fig. 4-5

Parameter description:

Port:

Display TP / Fiber port. The TP Port is RC-2201/02's Ethernet 10/100/1000Mbps UTP interface. The Fiber Port is RC-2201/02's Ethernet 1000Mbps Fiber interface.

Link Status: UP, Down

Show if the link on the port is active. If the link is connected to a working well device, the Link will show the link "Up", otherwise, "Down". This is determined by the negotiation of hardware.

Port State:

Show if the communication capability of the port is Enabled or Disabled. When enabled, traffic can be transmitted and received via this port. When disabled, no traffic can be transferred through this port. Port State is configured by user. Default is Enabled.

Auto Negotiation:

Show the exchange mode of Ethernet MAC. There are two modes supported in RC-2201/02. They are auto-negotiation mode "Enabled" and forced mode "Disabled". When in "Enabled" mode, this function will automatically negotiate by hardware itself and exchange each other the capability of speed and duplex mode with other site which is linked, and come out the best communication way. When in "Disabled" mode, both parties must have the same setting of speed and duplex, otherwise, both will not be linked. In this case, the link result is "Down".

Default: TP port is Enabled mode, FX port is Disabled mode.

Speed/Duplex:

Display the speed and duplex of all port. There are two speeds 10Mbps and 100Mbps supported in RC-2201/02. The duplex supported is half duplex and full duplex. The status of speed/duplex mode is determined by 1) the negotiation of both local port and link partner in "Enabled" mode or 2) user setting in "Disabled" mode. The local port has to be preset its capability.

In TP port is supported Fast Ethernet with TP media, so the result will show 100Mbps/full duplex, 100Mbps/half duplex, 10Mbps/Full duplex and 10Mbps/half duplex.

In FX port is supported Fast Ethernet with Fiber media, so the result will show 100Mbps/full duplex or 100Mbps/half duplex.

Default: TP port: None, depends on the result of the negotiation

FX port: 100Mbps/Full duplex

Flow Control: Enabled, Disabled

Show each port's flow control status. There are two types of flow control in Ethernet, Backpressure for half-duplex operation and Pause flow control (IEEE802.3x) for full-duplex operation. RC-2201/02 supports both of them. When duplex mode is half duplex, there is only one status "Enabled" for flow control. When in full duplex, it may be one of "Enabled", or "Disabled". Default: Enabled

Media Type:

Only "UTP Cable" and "Fiber Cable" are in this model.

Connector:

Display the connector type, for instance, UTP, SC, ST, LC and so on.

Fiber Mode:

Display the fiber mode, for instance, Multi-mode, Single-mode.

Fiber Cable:

Display the cable type, for instance, Dual Wire, Single Wire.

Wavelength:

Display the wavelength of the light transmitted in the fiber, for instance, 1310nm, 1550nm.

Max .Distance:

Display the maximum distance the port supported, for instance, 100m, 20km, 40km and so on.

Speed:

Display the maximum speed of the port, for instance, "1G", "100M".

Function name:

Port Counters

Function description:

Display the counting of each port's traffic, sorted according to the items described in the parameter description.

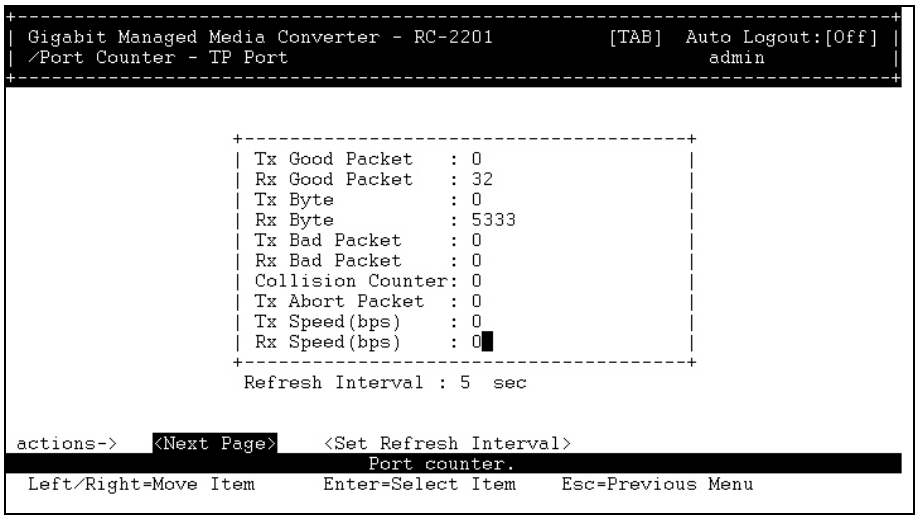

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Port Counter - TP Port
admin
Tx Good Packet : 0
Rx Good Packet : 32
Tx Byte : 0
Rx Byte : 5333
Tx Bad Packet : 0
Rx Bad Packet : 0
Collision Counter: 0
Tx Abort Packet : 0
Tx Speed(bps) : 0
Rx Speed(bps) : 0
Refresh Interval : 5 sec
actions-> <Next Page> <Set Refresh Interval>
Port counter.
Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-6

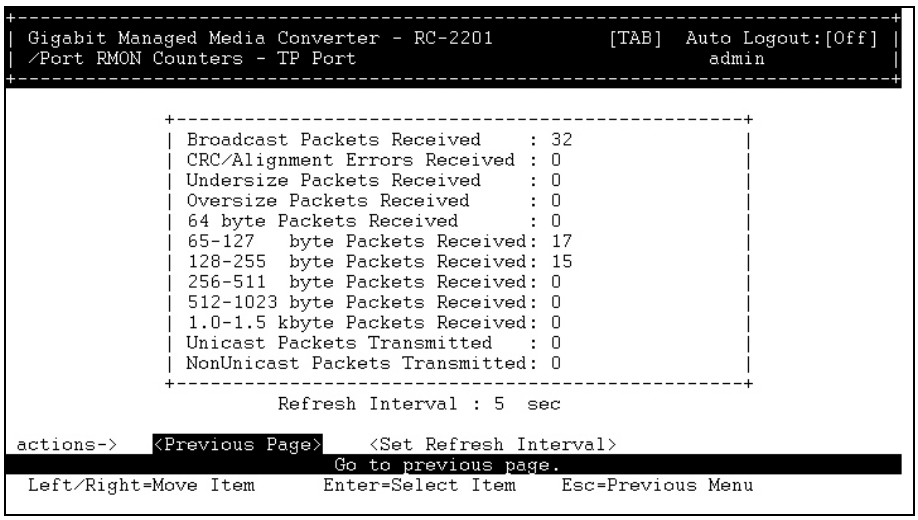

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Port RMON Counters - TP Port
admin
Broadcast Packets Received : 32
CRC/Alignment Errors Received : 0
Undersize Packets Received : 0
Oversize Packets Received : 0
64 byte Packets Received : 0
65-127 byte Packets Received: 17
128-255 byte Packets Received: 15
256-511 byte Packets Received: 0
512-1023 byte Packets Received: 0
1.0-1.5 kbyte Packets Received: 0
Unicast Packets Transmitted : 0
NonUnicast Packets Transmitted: 0
Refresh Interval : 5 sec
actions-> <Previous Page> <Set Refresh Interval>
Go to previous page.
Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-7

Parameter description:

Refresh Interval:

A Refresh Interval selection is used to set or change web view counters refresh period. It can be set from 3 seconds to 10 seconds.

TP Port:

Ethernet 10/100/1000Mbps UTP interface of RC-2201/02.

Fiber Port:

Ethernet 1000Mbps Fiber interface of RC-2201/02.

Tx Good Packet:

The counting number of the packet transmitted successfully.

Rx Good Packet:

The counting number of the packet received which is treated as good.

Tx Byte:

Total transmitted bytes.

Rx Byte:

Total received bytes.

Tx Bad Packet:

The counting number of the packet transmitted abnormally.

Rx Bad Packet:

The counting number of the packet received which is treated as bad.

Collision Counter:

Collision times.

Tx Abort Packet:

The counting number of the packet aborted during transmission.

Tx Speed (bps):

Show the average transmission rate in bit per second. The time interval is user-defined.

Rx Speed (bps):

Show the average received data rate in bit per second. The time interval is user-defined.

Broadcast Packets Received:

Show the counting number of the broadcast packet.

CRC/Alignment Errors Received:

Show the counting number of the packet with CRC and Alignment error.

Undersize Packets Received:

Show the counting number of the packet with the length less than 64 bytes.

Oversize Packets Received:

Show the counting number of the packet with the length more than 1522/1536 bytes depend on maximum packet length setting.

64 byte Packets Received:

Show the counting number of the packet with exact 64 bytes length.

65-127 byte Packets Received:

Show the counting number of the packet with the length between 65 to 127 bytes.

128-255 byte Packets Received:

Show the counting number of the packet with the length between 128 to 255 bytes.

256-511 byte Packets Received:

Show the counting number of the packet with the length between 256 to 511 bytes.

512-1023 byte Packets Received:

Show the counting number of the packet with the length between 512 to 1023 bytes.

1.0-1.5 kbyte Packets Received:

Show the counting number of the packet with the length between 1024 to 1536 bytes.

Unicast Packets Transmitted:

Show the counting number of total unicast packets transmitted.

NonUnicast Packets Transmitted:

Show the counting number of both total multicast and broadcast packets transmitted.

Function name:

Port Configuration

Function description:

Change the state and configuration of each port.

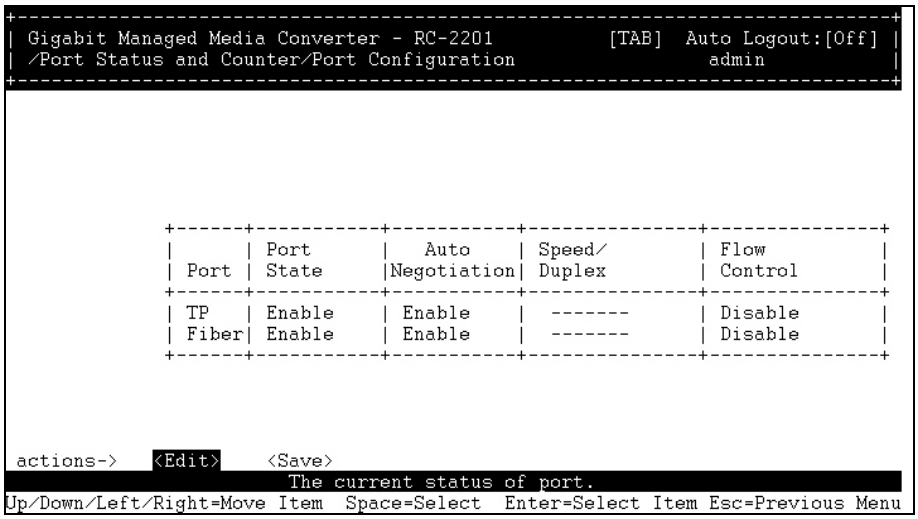


Fig. 4-8

Parameter description:

Port:

The TP Port is RC-2201/02's Ethernet UTP interface.

The Fiber Port is RC-2201/02's Ethernet Fiber interface.

Port State:

Show if the communication capability of the port is Enabled or Disabled. When enabled, traffic can be transmitted and received via this port. When disabled, the port is blocked and no traffic can be transferred through this port. Port State is configured by the user. Only two states "Enable" and "Disable" are able to be chosen. If you set a port's state "Disable", then that port is prohibited from passing any traffic, even it looks Link up. Default is Enable.

Auto Negotiation:

Only “Enable” and “Disable” two states can be chosen. “Enable” means the port adopted the auto-negotiation algorithm to exchange the capability with the linked partner. When enabled, the speed, duplex mode and flow control mode may change. “Disable” means the forced mode is adopted. When disabled, if you want to set up a connection successfully, you must have both port configuration of local port and linked partner be the same. If their configuration is different, the link will not be set up successfully. In RC-2201/02, fiber port supports forced mode only.

Speed/Duplex:

Set the mode of speed and duplex. In speed, 10/100/1000Mbps baud rate is available for Fast Ethernet TP port. The Fiber port is available in speed 1000Mbps only. If the media is 1Gbps fiber, it is always 1000Mbps and the duplex is full only. If the media is TP, the Speed/Duplex is comprised of the combination of speed mode, 10/100/1000Mbps, and duplex mode, full duplex and half duplex.

Flow Control:

There are three modes to choose in flow control, including Asymmetric, Symmetric and Disable. If Symmetric flow control is set, both parties can send PAUSE frame to the transmitting device(s) if the receiving port is too busy to handle. If Asymmetric flow control is set, this will let the receiving port not care the PAUSE frame from transmitting device(s). This is one-way flow control. When it is set Disable, there will be no flow control in the port. It drops the packet if too much to handle.

Default: Symmetric in full-duplex mode and Backpressure in half duplex.

4-4. Configuration

There are four major configuration function folders, including:

- **System Configuration**
  - Create Username / Password
  - Change Username / Password
  - IP Configuration
  - System Time Setting
  - Location/Contact Setting
  - TP Port Management
  - Power Down Setting
- **Network Management**
  - SNMP Configuration
  - Packet Length
  - Broadcasting Suppression
  - Spanning Tree Configuration
  - Misc. Feature Configuration
  - Filtering Configuration
  - VLAN Configuration
- **Trap/Alarm Configuration**
  - Trap Events Configuration
  - Alarm Configuration
- **Save Configuration**
  - Save As User Configuration
  - Restore Default Configuration
  - Restore User Configuration

4-4-1. System Configuration

There are seven functions contained in the System Configuration function folder. They are Create Username/Password, Change Username/Password, IP Configuration, System Time Setting, Location/Contact Setting, TP Port Management and Power Down Setting.

4-4-1-1. Create Username / Password

In this function, only administrator can create the new guest username and password. Only one administrator user and maximum four guest users are allowed to exist in the RC-2201/02. The default setting is as follows:

Username : admin
Password : admin

Fig. 4-9

4-4-1-2. Change Username / Password

In this function, only administrator can create, modify or delete the username and password. Administrator can modify other guest identities' password without confirming the password but it is necessary to modify the administrator-equivalent identity. Guest-equivalent identity can only modify his own password. Please note that you must confirm administrator/guest identity on the list of Username in advance before configuring the username and password. The default setting is as follows:

Username : admin
Password : admin

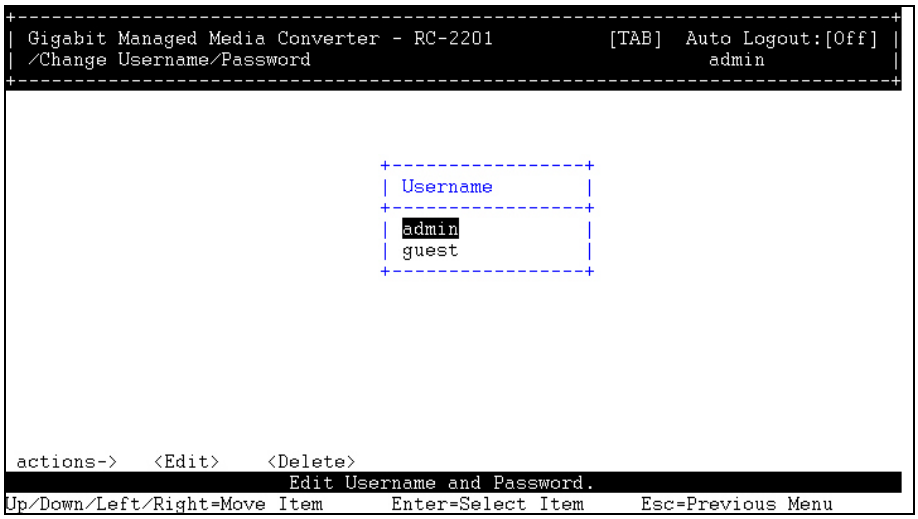


Fig. 4-10

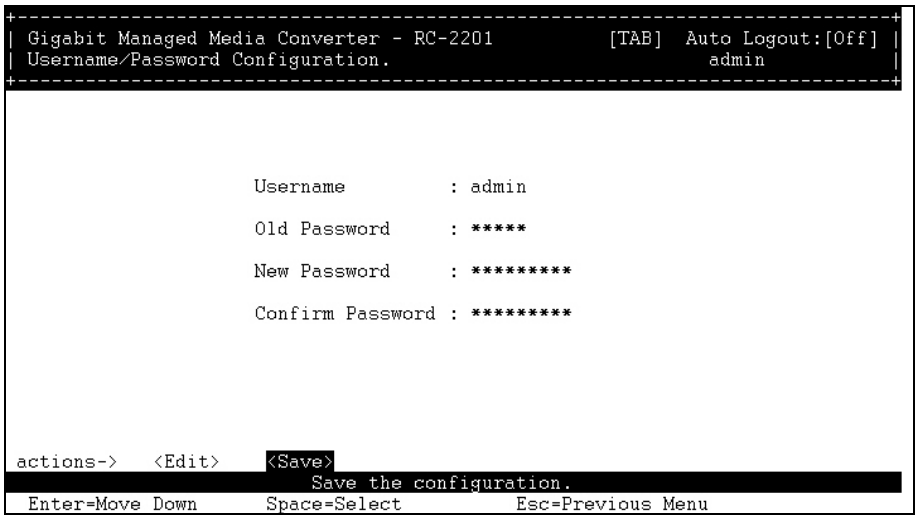


Fig. 4-11

4-4-1-3. IP Configuration

IP configuration is one of the most important configurations in RC-2201/02. Without the proper setting, network manager will not be able to see the device. RC-2201/02 supports both manual IP address setting and automatic IP address setting via DHCP server. When IP address is changed, you must reboot the converter to have the setting taken effect and use the new IP for web management and telnet console management.

Function name: IP Configuration

Function description:

Set IP address, subnet mask, default gateway and DNS for RC-2201/02.

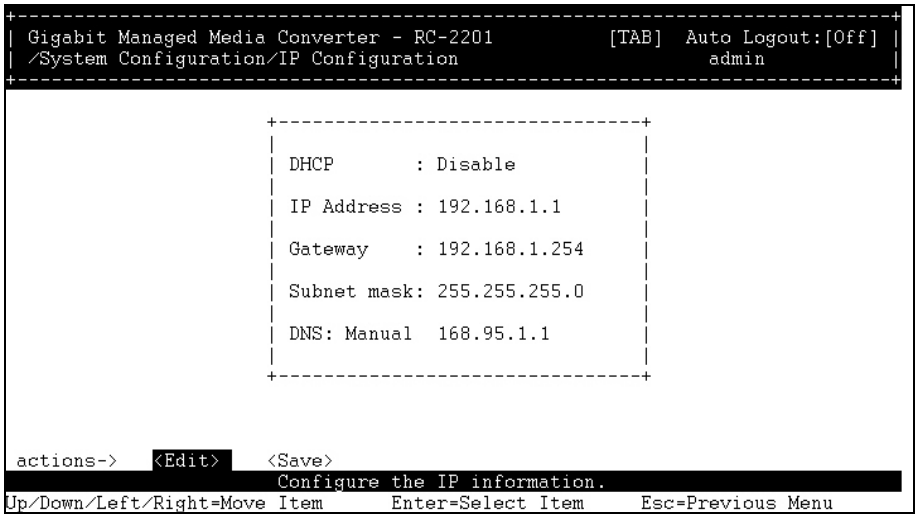


Fig. 4-12

Parameter description:

DHCP:

RC-2201/02 supports DHCP client used to get an IP address automatically if you set this function “Enable”. RC-2201/02 will find the DHCP server existed in the network to get an IP address. If DHCP server is down or does not exist and DHCP in RC-2201/02 is enabled, then RC-2201/02 will count down 60 seconds and use its fixed IP set last time. If this function is set “Disable”, you have to input IP address manually. For more details about IP address, please see the 2-2-4 section “IP Address Assignment” in this manual.

Default: Disable

IP Address:

Users can configure the IP settings and fill in new values if users set the DHCP function “Disable”. Then, move the cursor to **<Save>** and press **<Enter>** key to update it. Default: 192.168.1.1

Gateway:

Set an IP address for a gateway to handle those packets that do not meet the rules predefined in a device. If a packet does not meet the criteria for other routers, then it must be sent to a default router. This means any packet with undefined TCP/IP information will be sent to this device unconditionally. Default: 192.168.1.254

Subnet Mask:

Set the subnet mask value which is the same as that of network it attaches. For more information, please also see the section “IP Address Assignment” in this manual. Default: 255.255.255.0

DNS:

Set an IP address for a Domain Name Server. The RC-2201/02 DNS client program will ask the Domain Name Server to resolve the IP address of the named host. To select the “Manual” for fixed DNS IP address setting. To select “Auto” the DNS IP address will be assigned from DHCP server. The default DNS setting is empty.

Default: DNS : -----

4-4-1-4. System Time Setting

RC-2201/02 provides manual and automatic ways to set the system time via NTP. Manual setting is simple and you just input “Year”, “Month”, “Day”, “Hour”, “Minute” and “Second” within the valid value range indicated in each item. If you input an invalid value, for example, 61 in minute, the converter will clamp the figure to 59.

NTP is a well-known protocol used to synchronize the clock of the RC-2201/02 system time over a network. NTP, an internet draft standard formalized in RFC 1305, has been adopted on the system is version 3 protocol. RC-2201/02 provides four built-in real internet site NTP server IP addresses and a user-defined NTP server IP address. The time zone is Greenwich-centered which uses the expression form of GMT+/- xx hours.

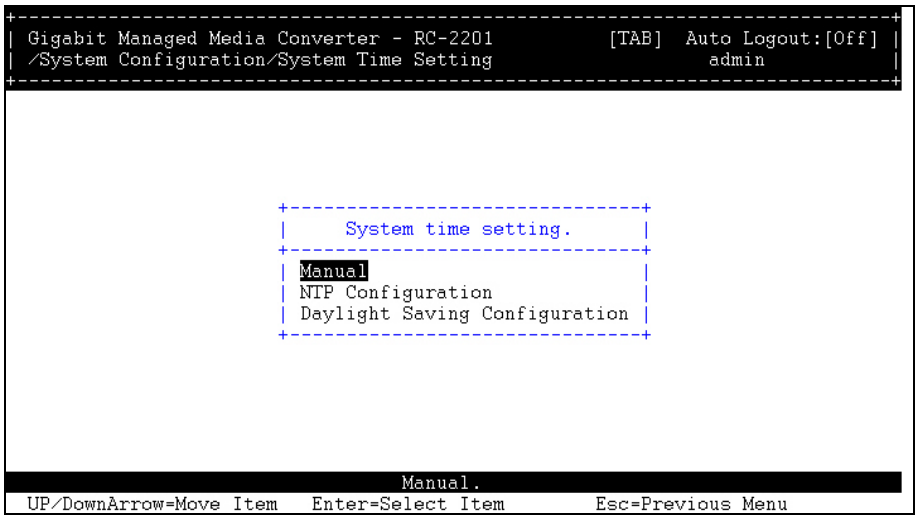


Fig. 4-13

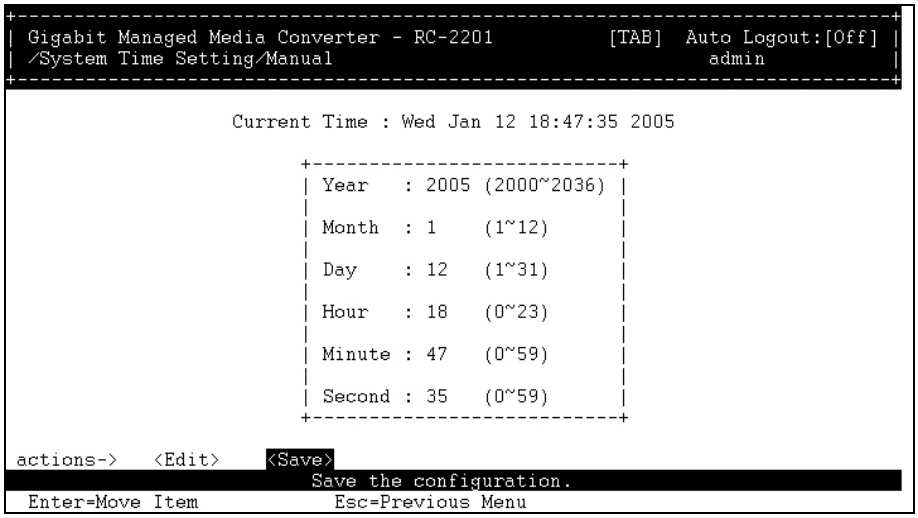


Fig. 4-14

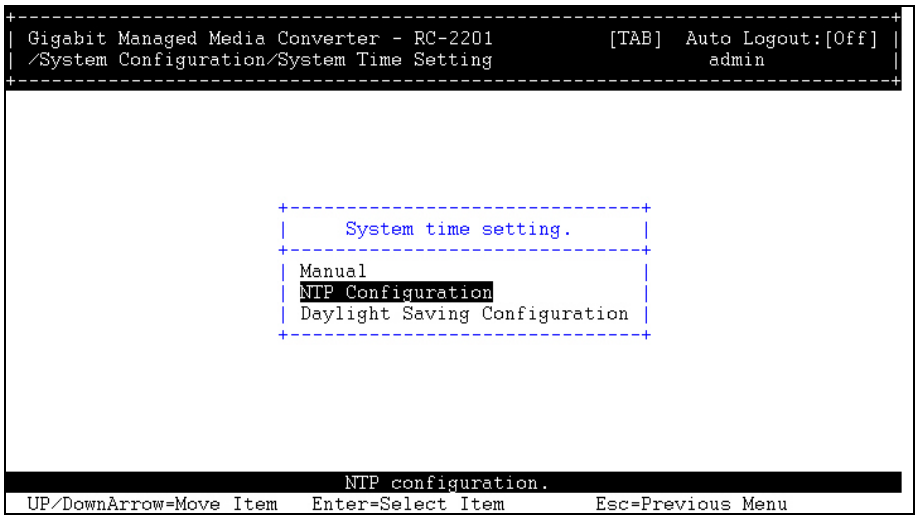


Fig. 4-15

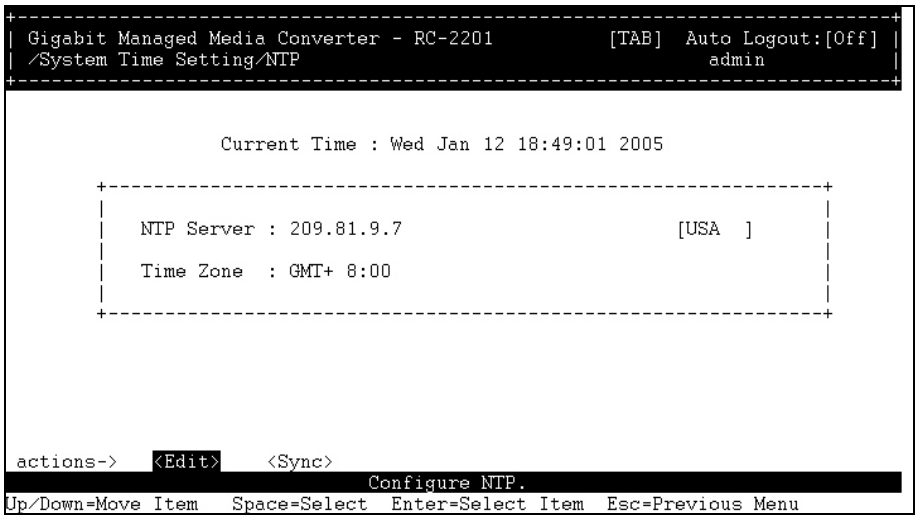


Fig. 4-16

Function name:

System Time Setting

Function description:

Set the system time by manual input or set it by syncing from Time servers. The function also supports daylight saving for different area's time adjustment.

Parameter description:

Manual:

This is the function to adjust the time manually. Filling the valid figures in the fields of Year, Month, Day, Hour, Minute and Second respectively. Then, move cursor to **<Save>** and press **<Enter>** key, time is adjusted. The valid figures for the parameter Year, Month, Day, Hour, Minute and Second are >=2000, 1-12, 1-31, 0-23, 0-59 and 0-59 respectively. Input the wrong figure, the device will reject the time adjustment request. There is no time zone setting in Manual mode.

Default: Year = 2000, Month = 1, Day = 1

Hour = 0, Minute = 0, Second = 0

NTP:

NTP is Network Time Protocol and is used to sync the network time based Greenwich Mean Time (GMT). If use the NTP mode and select a built-in NTP time server or manually specify an user-defined NTP server as well as Time Zone, RC-2201/02 will sync the time in a short after moving the cursor to **<Sync>** and press **<Enter>** key. Though it synchronizes the time automatically, NTP does not update the time periodically without user's processing.

Time Zone is an offset time off GMT. You have to select the time zone first and then perform time sync via NTP because RC-2201/02 will combine this time zone offset and updated NTP time to come out the local time, otherwise, you will not able to get the correct time. RC-2201/02 supports configurable time zone from –12 to +13 step 1 hour.

Default Time zone: +8 Hrs.

Daylight Saving:

Daylight saving is adopted in some countries. If set, it will adjust the time lag or in advance in unit of hours, according to the starting date and the ending date. For example, if you set the day light saving to be 1 hour. When the time passes over the starting time, the system time will be increased one hour after one minute at the time since it passed over. And when the time passes over the ending time, the system time will be decreased one hour after one minute at the time since it passed over.

RC-2201/02 supports valid configurable day light saving time is –5 ~ +5 step one hour. The zero for this parameter means it need not have to adjust current time, equivalent to in-act daylight saving. You don't have to set the starting/ending date as well. If you set daylight saving to be non-zero, you have to set the starting/ending date as well; otherwise, the daylight saving function will not be activated.

Default for Daylight Saving: 0.

The following parameters are configurable for the function Daylight Saving and described in detail.

Day Light Saving Start :

This is used to set when to start performing the daylight saving time.

Mth:

Range is 1 ~ 12.

Default: 1

Day:

Range is 1 ~ 31.

Default: 1

Hour:

Range is 0 ~ 23.

Default: 0

Day Light Saving End :

This is used to set when to stop performing the daylight saving time.

Mth:

Range is 1 ~ 12.

Default: 1

Day:

Range is 1 ~ 31.

Default: 1

Hour:

Range is 0 ~ 23.

Default: 0

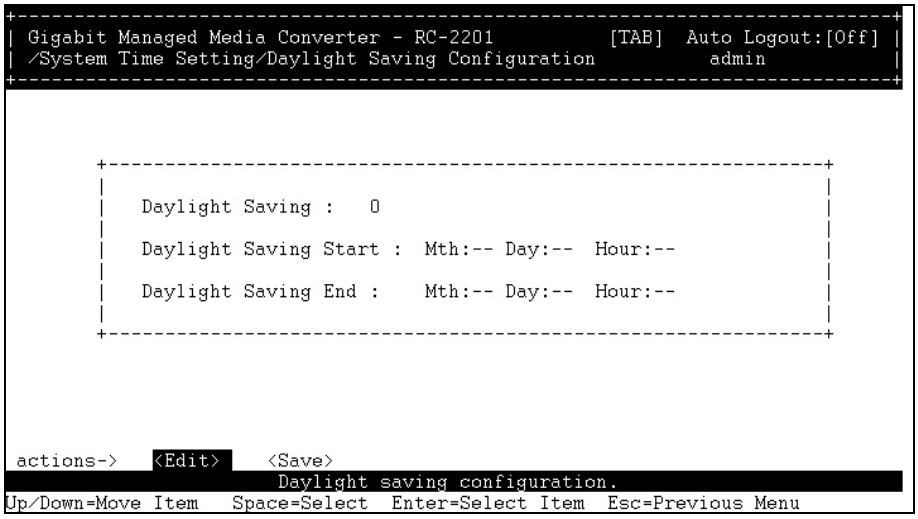

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/System Time Setting/Daylight Saving Configuration
admin
Daylight Saving : 0
Daylight Saving Start : Mth:-- Day:-- Hour:--
Daylight Saving End : Mth:-- Day:-- Hour:--
actions-> <Edit> <Save>
Daylight saving configuration.
Up/Down=Move Item Space=Select Enter=Select Item Esc=Previous Menu

Fig. 4-17

4-4-1-5. Location/Contact Setting

Function name:

Location/Contact Setting

Function description:

The Location and Contact fields could be filled some information for network manager reference. The location field could be filled the device location information. Thus, the device maintainer could easy to find out this device. The contact field could be filled the device maintainer information e.g. name, phone number, etc. It is easy for the network manager to contact the device maintainer.

Parameter description:

Location:

The location field could be filled the device location information with any visual characters. The default setting is empty. User-defined.

Contact:

The contact field could be filled the device maintainer information with any visual characters. The default setting is empty. User-defined.

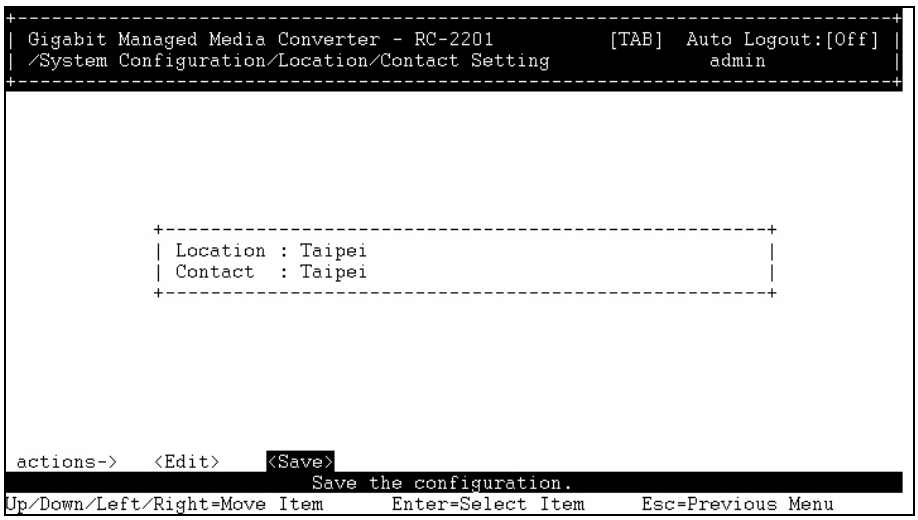

Gigabit Managed Media Converter - RC-2201 [TAB] Auto Logout:[Off]
/System Configuration/Location/Contact Setting admin
Location : Taipei
Contact : Taipei
actions-> <Edit> <Save>
Save the configuration.
Up/Down/Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-18

4-4-1-6. TP Port Management

Function name:

TP Port Management

Function description:

This TP Port Management design is concerning security enhanced. This remote converter should be put on CPE site in general application, thus the TP port is connected to network of customer. There are many attack issue possible enter from TP port to effect the RC-2201/02 managed function. To isolate the traffics with managed RC-2201/02 request from TP port when the TP port management is disabled.

Parameter description:

Disable:

To isolate the traffics with managed RC-2201/02 request from TP port when the TP port management was set to “Disabled”.

Enable:

Allow the traffics with managed RC-2201/02 request from TP port when the TP port management was set to “Enabled”.

Default: Enable

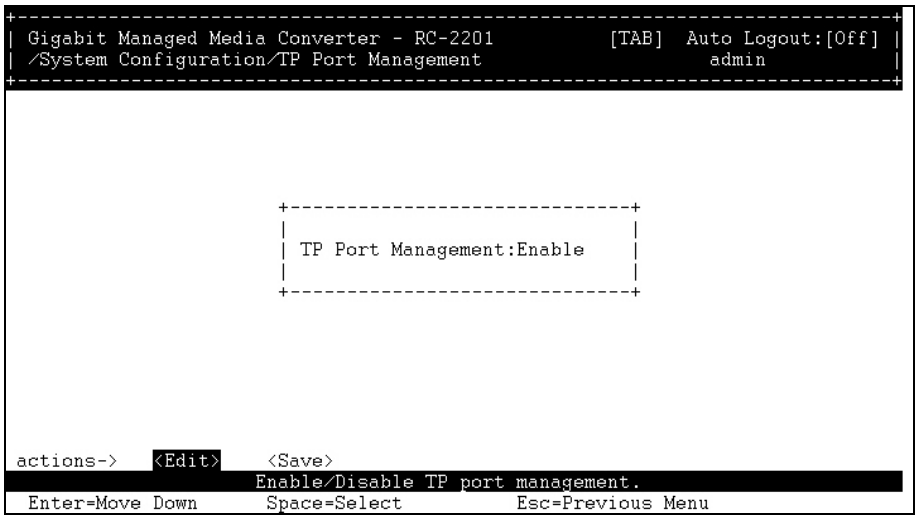


Fig. 4-19

4-4-1-7. Power Down Setting

Function name:

Power Down Setting

Function description:

This design is concerning for system safety. This function will detect two things: the temperature if over 60°C, the cooling fan if failed. If these two conditions happened at the same time and the "Power Down Setting" was enabled, the RC-2201/02 will power down automatically.

Parameter description:

Disable:

If this function is disabled, the RC-2201/02 will keep working regardless of the temperature was over 60°C and the cooling fan failed at the same time.

Enable:

In this status, the RC-2201/02 will power down automatically while the temperature was over 60°C and the cooling fan failed at the same time.

Default: Enable

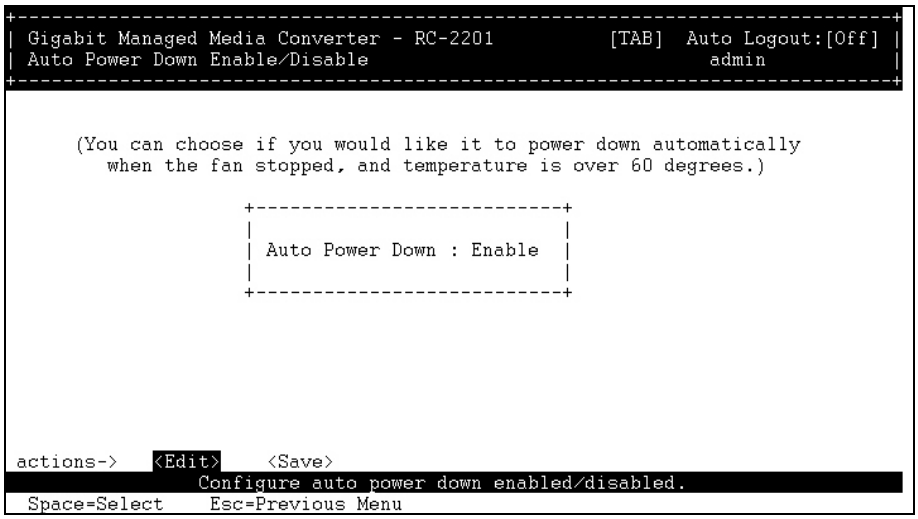

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
Auto Power Down Enable/Disable
admin
(You can choose if you would like it to power down automatically
when the fan stopped, and temperature is over 60 degrees.)
Auto Power Down : Enable
actions-> <Edit> <Save>
Configure auto power down enabled/disabled.
Space=Select Esc=Previous Menu

Fig. 4-20

4-4-2. SNMP Configuration

Function name:

SNMP Configuration

Function description:

Any Network Management running the Simple Network Management Protocol (SNMP) can manage the converter equipped with SNMP agent, provided that the Management Information Base (MIB) is installed correctly on the management station. The SNMP is a protocol that is used to govern the transfer of information between SNMP manager and agent. The SNMP agent is running on the converter if you set the SNMP "Enable". If the SNMP is set "Disable", the related Community Name, Trap Host IP Address, Trap and RMON counters will be ignored.

In the SNMP Configuration function, the community string is used as a password to authenticate the request. If both have the same community name, they can talk each other; otherwise, network management unit cannot access the converter via SNMP protocol. To set up a trap host means to create a trap manager by assigning an IP address to host the trap message. In other words, the trap host is a network management unit with SNMP manager receiving the trap message from the converter with SNMP agent issuing the trap message. 4 trap hosts can prevent the important trap message from losing.

A SNMP manager must pass the authentication, then it can access the agent. So, both parties must have the same community name. You can also define the system name, system location and contact person for easy management via SNMP manager.

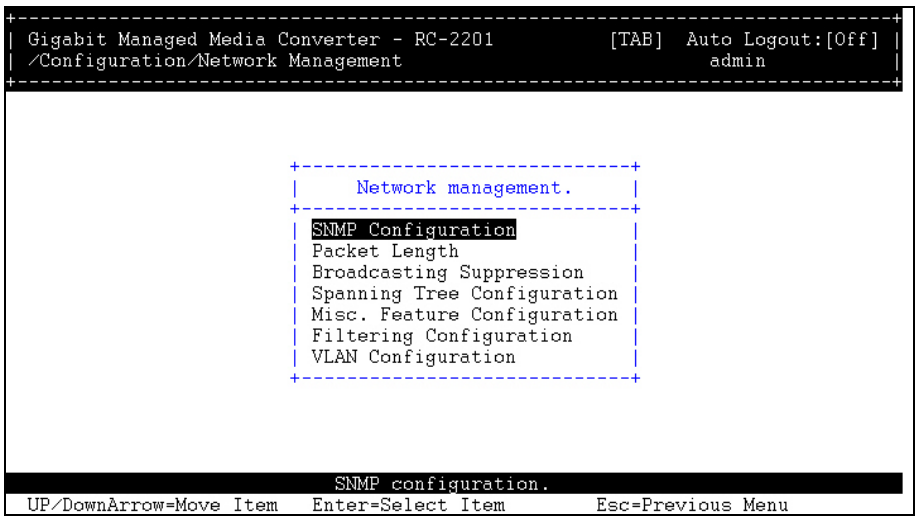


Fig. 4-21

Three functions are offered in the SNMP configuration, including SNMP Status, Community Strings and Trap Configuration. The explanations of these functions are as below in order.

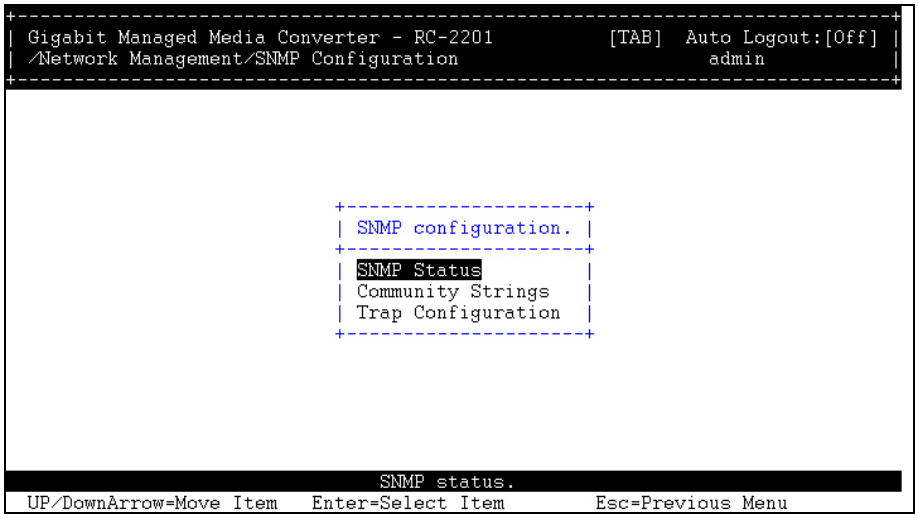


Fig. 4-22

Function name:

SNMP Status

Parameter description:

SNMP Status:

Only “Enable” and “Disable” two kinds of status are supported. User can use the **<Space>** bar to toggle the status of this function.

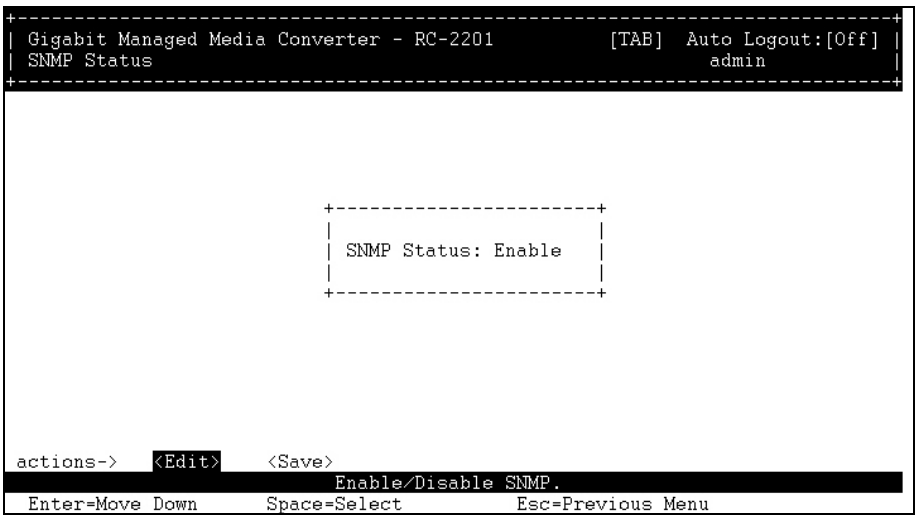


Fig. 4-23

Function name:

Community Strings

Parameter description:

Get Community Name:

Users can fill in specified SNMP Get community name.

Set Community Name:

Users can fill in specified SNMP Set community name.

Trap Host 1-4 IP Address / Community Name:

Users can fill in specified trap host 1-4 IP addresses with SNMP community name.

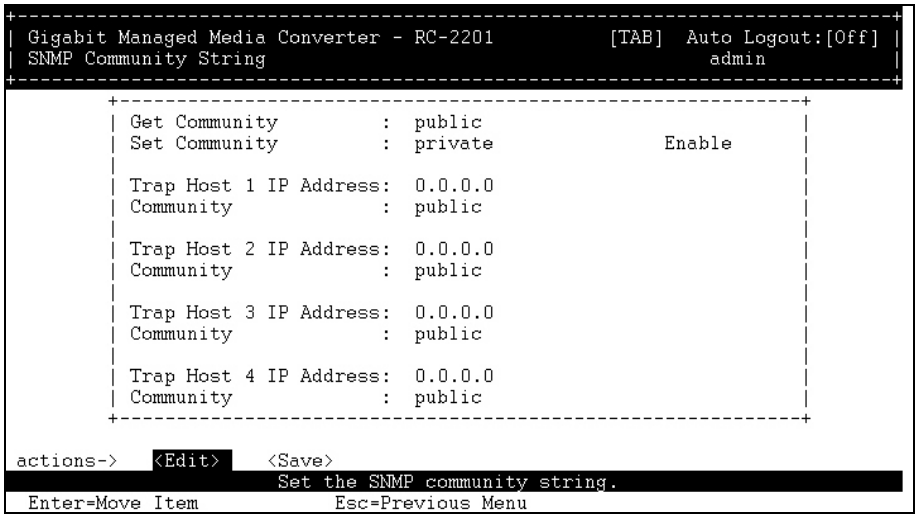


Fig. 4-24

Function name:

Trap Configuration

Function description:

Trap is a PDU packet sent by SNMP agent in the Managed Media Converter. The Managed Media Converter will send the trap packet containing the useful information about an unusual event to the SNMP manager. The information includes cold start trap, warm start trap, link down trap, link up trap and authentication failure trap. In RC-2201/02 converter, SNMP agent will automatically send cold start trap and warm start trap to SNMP manager after booting successfully.

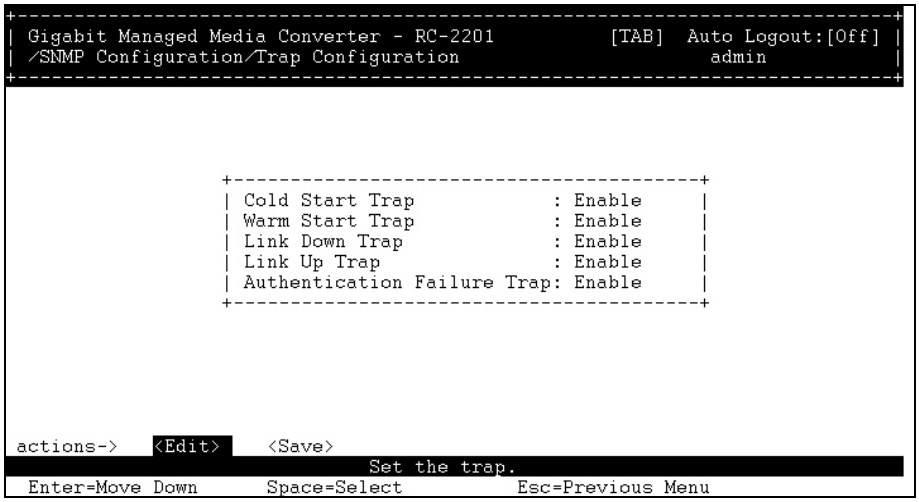


Fig. 4-25

Parameter description:

Cold Start Trap:

This trap packet will be sent while RC-2201/02 Converter's power is cycling.

Warm Start Trap:

This trap packet will be sent while rebooting RC-2201/02 Converter by means of pressing the RC-2201/02's RESET button or running Reboot function of software.

Link Down Trap:

This trap packet will be sent while the RC-2201/02 Converter's UTP link status is changed from up to down. The Link Down Trap Packet will not be sent while RC-2201/02 Converter's fiber port link status is changed from up to down. The fiber port Link Down Event will be stored in Log Data.

Link Up Trap:

This trap packet will be sent while the RC-2201/02 Converter's UTP or Fiber port link status is changed from down to up.

Authentication Failure Trap:

This trap packet will be sent while the RC-2201/02 SNMP agent authentication failure occurs. Authentication failure means that SNMP agent receives a SNMP request with error community name.

4-4-3. Packet Length

RC-2201/02 provides two levels of Ethernet frame size for the user to set up. One is 1536 bytes and the other is 1522 bytes. After selecting one of these two options, then move the cursor to **<Save>** and press **<Enter>** key, the setting will take effect immediately. Default setting is 1522 bytes long which can afford accommodating the size of the tagged VLAN frame.

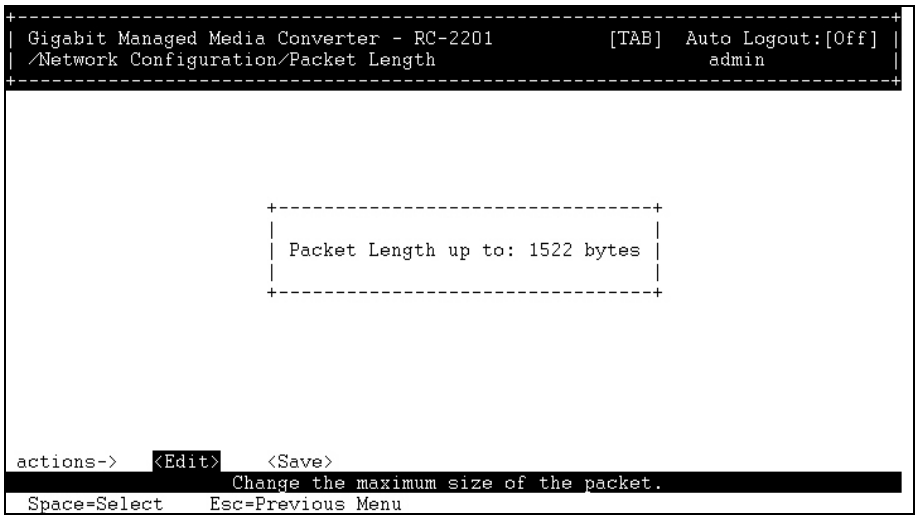


Fig. 4-26

4-4-4. Broadcasting Suppression

Function name:

Broadcasting Suppression

Function description:

The Broadcasting Suppression function is used to spread the request broadcast packet into a bigger time frame to prevent the traffic congestion due to broadcast packets from many network devices which may seek its NMS, boot server, DHCP server and many connections predefined when the whole building or block loses the power and then reboot and recover. At this moment, a bunch of converter or other network device on the LAN will try its best to find the server to get the services or try to set up the predefined links, they will issue many broadcast packets in the network.

RC-2201/02 supports a random delay time for DHCP and boot delay for each device. This suppresses the broadcast storm while all devices are at booting stage in the same time. The maximum user-defined delay time is 30 sec. If Broadcasting Suppression function is enabled, the delay time is set randomly, ranging from 0 to 30 seconds, because the exactly delay time is computed by the converter itself. The default is “Disable”.

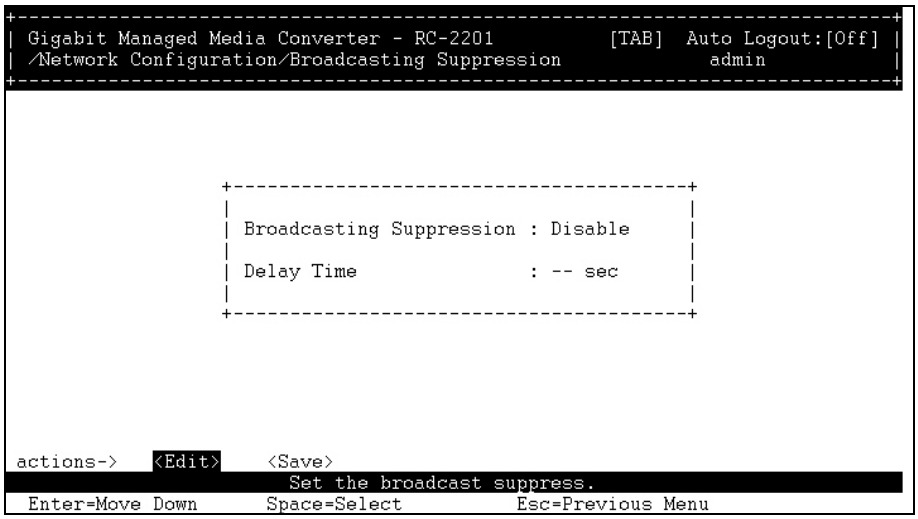


Fig. 4-27

4-4-5. Spanning Tree Configuration

The Spanning Tree Protocol (STP) is a standardized method (IEEE 802.1D) for avoiding loops in switched networks. When STP is enabled, ensure that only one path is active between any two nodes on the network at a time. User can enable Spanning Tree Protocol on converter's console management and then set up other advanced items. We recommend that you enable STP on all converters to ensure a single active path on the network.

4-4-5-1. STP Enable/Disable

Function name:

STP Enable/Disable

Function description:

Spanning Tree Protocol: User can use the **<Space>** key to toggle the status of this function.

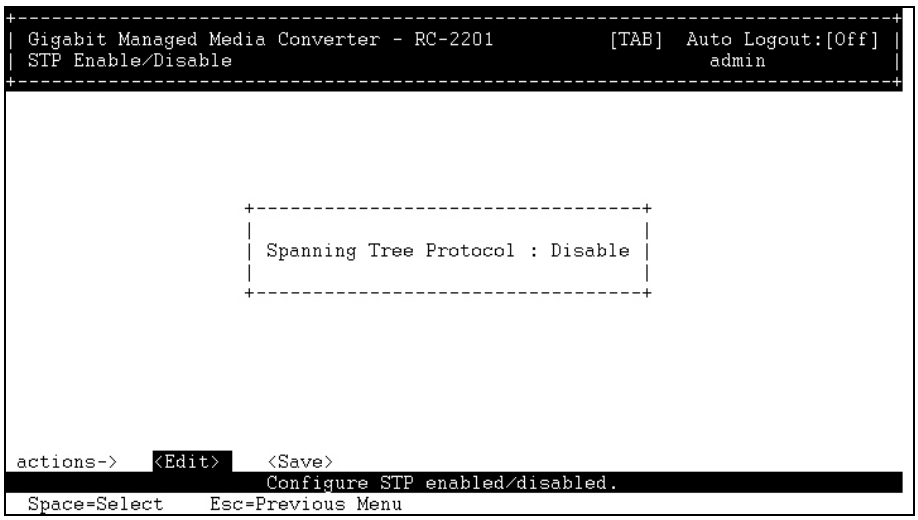


Fig. 4-28

Parameter description:

Spanning Tree Protocol:

Set 802.1W Rapid STP function Enable / Disable. Default is "Disable"

4-4-5-2. STP Status

Function name:

STP Status

Function description:

In the Spanning Tree Status, user can read 11 parameters to know STP current status. The 11 parameters' description is listed in the following table.

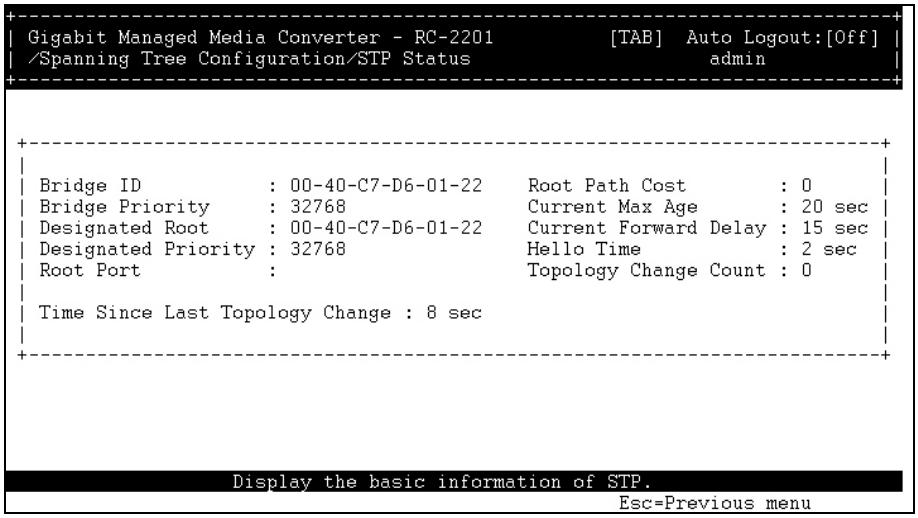

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Spanning Tree Configuration/STP Status
admin
Bridge ID : 00-40-C7-D6-01-22
Bridge Priority : 32768
Designated Root : 00-40-C7-D6-01-22
Designated Priority : 32768
Root Port :
Root Path Cost : 0
Current Max Age : 20 sec
Current Forward Delay : 15 sec
Hello Time : 2 sec
Topology Change Count : 0
Time Since Last Topology Change : 8 sec
Display the basic information of STP.
Esc=Previous menu

Fig. 4-29

Parameter description:

Bridge ID:

Show converter's bridge ID which stands for the MAC address of this converter.

Bridge Priority:

Show this converter's current bridge priority setting. Default is 32768.

Designated Root:

Show root bridge ID of this network segment. If this converter is a root bridge, the "Designated Root" will show this converter's bridge ID.

Designated Priority:

Show the current root bridge priority.

Root Port:

Show port number connected to root bridge with the lowest path cost.

Root Path Cost:

Show the path cost between the root port and the designated port of the root bridge.

Current Max. Age:

Show the current root bridge maximum age time. Maximum age time is used to monitor if STP topology needs to change. When a bridge does not receive a hello message from root bridge until the maximum age time is counted down to 0, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-learn and determine which the root bridge is. Maximum Age time is assigned by root bridge in unit of seconds. Default is 20 seconds.

Current Forward Delay:

Show the current root bridge forward delay time. The value of Forward Delay time is set by root. The Forward Delay time is defined as the time spent from Listening state moved to Learning state or from Learning state moved to Forwarding state of a port in bridge.

Hello Time:

Show the current hello time of the root bridge. Hello time is a time interval specified by root bridge, used to request all other bridges periodically sending hello message every “hello time” seconds to the bridge attached to its designated port.

Topology Change Count:

Topology Change Count expresses the time spent in unit of seconds since the beginning of the Spanning Tree Topology Change to the end of the STP convergence. Once the STP change is converged, the Topology Change count will be reset to 0. The figures showing in the screen may not be the exact time it spent but very close to, because the time is eclipsing.

Time Since Last Topology Change:

Time Since Last Topology Change is the accumulated time in unit of seconds the STP has been since the last STP Topology Change was made. When Topology Change is initiated again, this counter will be reset to 0. And it will also count again once STP topology Change is completed.

4-4-5-3. STP Configuration

The STP, Spanning Tree Protocol, actually includes RSTP. In the Spanning Tree Configuration, there are five parameters open for the user to configure as user's idea. Each parameter description is listed below.

Function name:

STP Configuration

Function description:

User can set the following Spanning Tree parameters to select mode RSTP/STP and affect STP state machine behavior to send BPDU in this converter.

Parameter description:

Bridge Priority:

The lower the bridge priority is, the higher priority it has. Usually, the bridge with the highest Bridge priority is the root. If you want to have RC-2201/02 as root bridge, you can set this value lower than that of bridge in the LAN. The valid value is 0 ~ 61440. The default is 32768.

Hello Time:

Hello Time is used to determine the periodic time to send normal BPDU from designated ports among bridges. It decides how long a bridge should send this message to other bridge to tell I am alive. When RC-2201/02 is the root bridge of the LAN, for example, all other bridges will use the hello time assigned by RC-2201/02 to communicate with each other. The valid value is 1 ~ 10 in unit of second. Default is 2 seconds.

Max. Age:

When RC-2201/02 is the root bridge, the whole LAN will apply this figure set by RC-2201/02 as their maximum age time. When a bridge received a BPDU originated from the root bridge and if the message age conveyed in the BPDU exceeds the Max. Age of the root bridge, the bridge will treat the root bridge malfunctioned and issue a Topology Change Notification (TCN) BPDU to all other bridges. All bridges in the LAN will re-calculate and determine who the root bridge is. The valid value of Max. Age is 6 ~ 40 seconds. Default is 20 seconds.

Forward Delay:

You can set the root bridge forward delay time. This figure is set by root bridge only. The forward delay time is defined as the time spent from Listening state moved to Learning state and also from Learning state moved to Forwarding state of a port in bridge. The forward delay time contains two states, Listening state to Learning state and Learning state to Forwarding state. It assumes that forward delay time is 15 seconds, then total forward delay time will be 30 seconds. This has much to do with the STP convergent time which will be more than 30 seconds because some other factors.

The valid value is 4 ~ 30 seconds, default is 15 seconds.

Force Version:

Two options are offered for the user's choosing STP algorithm. One is RSTP and the other is STP. If STP is chosen, RSTP will run as a legacy STP. RC-2201/02 supports RSTP (802.1w) which is backward compatible with STP (802.1d).

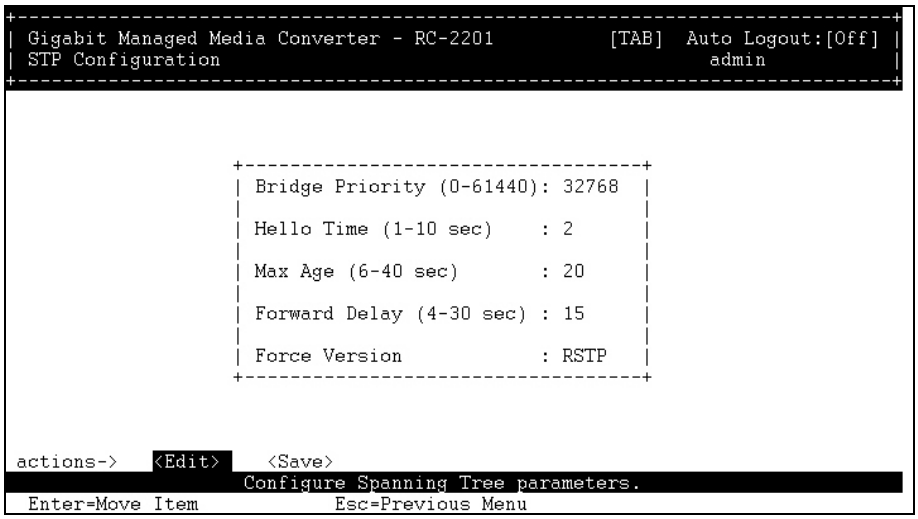


Fig. 4-30

Function name:

Port Setting

Function description:

In the STP Port Setting, one item selection and five parameters settings are offered for user's setup. User can disable and enable each port by selecting each Port State item. User also can set "Priority" and "Path Cost" of each port by filling in the desired value and set "Admin Edge Port" and "Admin Point To Point" by selecting the desired item.

Parameter description:

Port State:

It displays the current state of a port. We cannot manually set it because it displays the status only. There are three possible states. (according to 802.1w specification)

- DISCARDING state indicates that this port can neither forward packets nor contribute learning knowledge.

Notice: Three other states (Disable state, BLOCKING state and LISTENING state) defined in the 802.1d specification are now all represented as DISCARDING state.

- LEARNING state indicates this port can now contribute its learning knowledge but cannot forward packets still.

- FORWARDING state indicates this port can both contribute its learning knowledge and forward packets normally.

Path Cost:

The contribution value of the path through this port to Root Bridge. STP algorithm determines a best path to Root Bridge by calculating the sum of path cost contributed by all ports on this path. A port with a smaller path cost value would become the Root Port more possibly. The range is 0 – 200,000,000. In RC-2201/02, path cost with 0 value means automatic which will automatically assign the path cost value defined by IEEE 802.1w. Default: 0

802.1w RSTP recommended value: (Valid range: 1 – 200,000,000)
10 Mbps : 2,000,000
100 Mbps : 200,000
1 Gbps : 20,000

Priority:

Priority here means Port Priority. Port Priority and Port Number are mixed to form the Port ID. Port IDs are often compared in order to determine which port of a bridge would become the Root Port. The range is 0 – 240. Default is 128.

Admin Edge Port:

If user selects “Yes”, this port will be an edge port. An Edge Port is a port connected to a device that knows nothing about STP or RSTP. Usually, the connected device is an end station. Edge Ports will immediately transit to forwarding state. User can select “Yes” or “No”.
Default: No

Admin Point To Point:

We say a port is on a point-to-point link if the port is in full-duplex mode. RSTP fast convergence can only happen on a point-to-point link. To determine if this port is on a point-to-point link is by auto-detecting the port’s duplex mode if the parameter is set to “Auto”. If the parameter is set “True”, the port is unconditionally considered to be on a point-to-point link. If the parameter is set to “False”, fast transition to Forwarding state will not happen on this port. User can select “Auto”, “True” or “False”.
Default : Auto

M Check:

Migration Check. It forces the port sending out an RSTP BPDU instead of a legacy STP BPDU at the next transmission. The only benefit of this operation is to make the port quickly get back to act as an RSTP port. Move the cursor to **<M Check>** and press **<Enter>** key to send a RSTP BPDU from the port you specified.

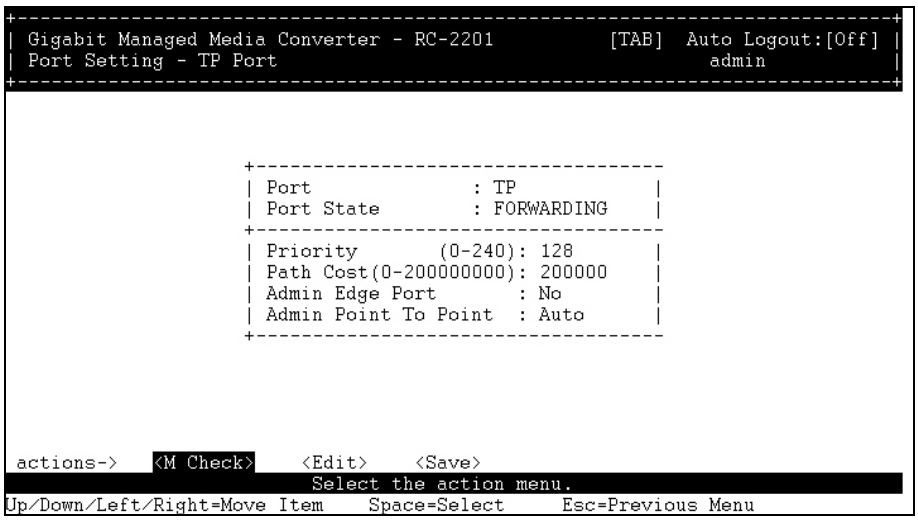


Fig. 4-31

4-4-6. Misc. Feature Configuration

Miscellaneous Feature Configuration gathers many functions, including MAC Table Maintenance, Broadcast Storm Filtering, Priority Queue Service and QoS Policy, which cannot be categorized to some function type. They are described below.

Function Name:

MAC Table Maintenance

Function Description:

This function is used to set the MAC Address Age-out Time applied to the whole MAC address table except some static MAC address. The range of MAC table entry age-out time is from 30, 33, 36,…765 seconds.

If a source node has not visited the converter for a time longer than the Age-out Time, its responded MAC address information in the converter's MAC table will be marked invalid by the converter's aging function. This age-out rule will not be applied to the static MAC addresses.

The default age-out time is 300 seconds.

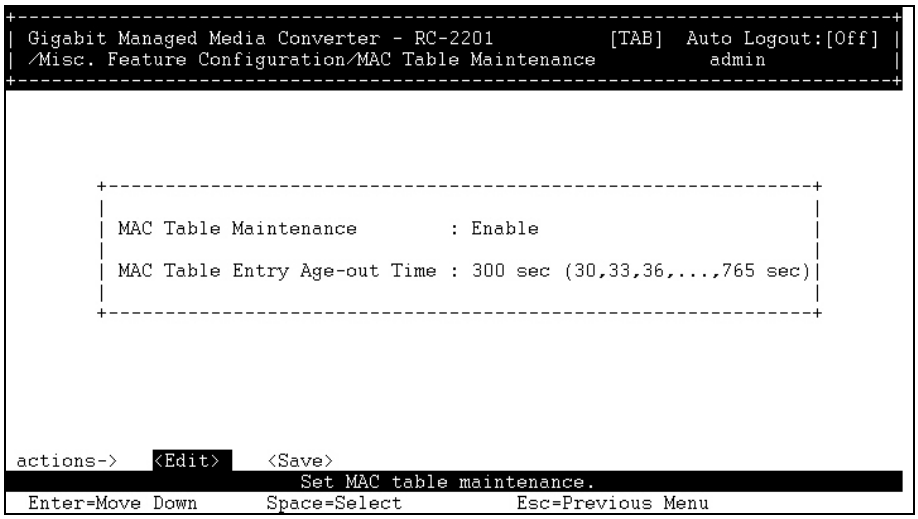

Gigabit Managed Media Converter - RC-2201 [TAB] Auto Logout:[Off]
/Misc. Feature Configuration/MAC Table Maintenance admin
MAC Table Maintenance : Enable
MAC Table Entry Age-out Time : 300 sec (30,33,36,...,765 sec)
actions-> <Edit> <Save>
Set MAC table maintenance.
Enter=Move Down Space=Select Esc=Previous Menu

Fig. 4-32

Function Name:

Broadcast Storm Filtering

Function Description:

Broadcast Storm Filtering is applied to filter the converter's broadcast traffic. If you choose an upper threshold, it is enabled. It is a global function. The setting will be applied to all ports of the converter.

The threshold is the percentage of the port's total bandwidth used by broadcast traffic. When broadcast traffic for a port rises above the threshold you set, broadcast storm filter discards the extra broadcast traffic. This keeps the total broadcast traffic less than the threshold able to be forwarded and limits too many broadcast packet running over the network. RC-2201/02 supports five threshold values, including 5%, 10%, 15%, 20%, and 25%.

Default is OFF.

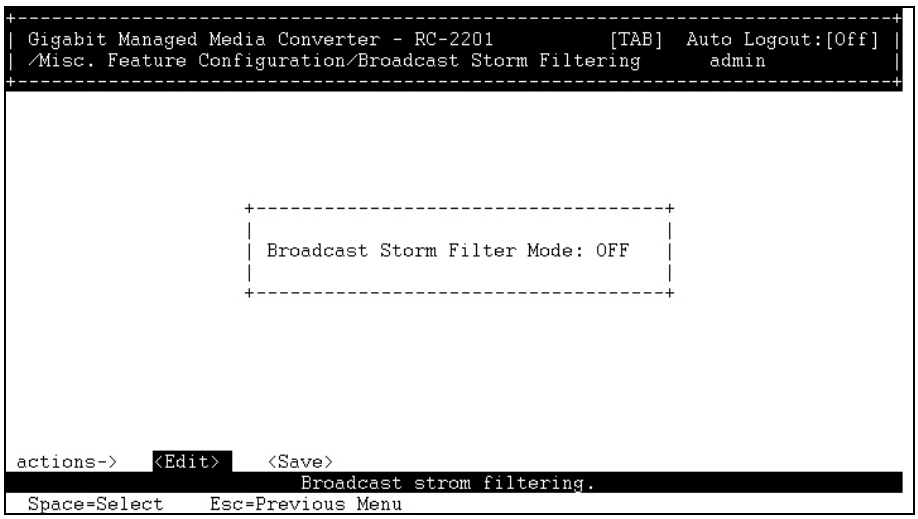


Fig. 4-33

Function name:

Priority Queue Service

Function Description:

RC-2201/02 provides three priority queue services for transmission scheduling, including FCFS, strict priority and WRR. It is a global function.

First Come First Service (FCFS): All incoming packets will be sent out upon the sequence of packet's arrival order.

All High before Low: After all high priority packets are sent out, then low ones are sent in turn.

Weighted Round Robin (WRR): This is actually a transmission ratio of high priority packet and low priority packet. If you would like to repeatedly send 5 high priority packets first and then 2 low priority packets. You can set a 5 to high weight field and a 2 to low weight field in WRR function row. The WRR Default Setting High = 2, Low = 1

Parameter description:

To set the time that the packets can reside in the queue of the converter.

Max. bridge transmit delay bound:

The function "Maximum bridge transmit delay bound" is applied to limit the maximum queuing time of the packets in the converter. If enabled, the packets queued over the time set will be dropped. Valid values are 1 sec., 2 sec., 4 sec. and OFF. Default value is OFF.

Delay Bound:

Limit the resided time of the low priority packets in the converter. If the low priority packet is not transmitted out and time set by "Delay bound" is enabled, the packet will be dropped. The valid delay time is 1 – 255 ms and OFF.

Default Max. Delay Time is 1ms.

NOTE: Make sure that "Max. bridge transmit delay bound" is enabled before enabling Delay Bound, because Delay Bound must work under "Max. bridge transmit delay bound is enabled".

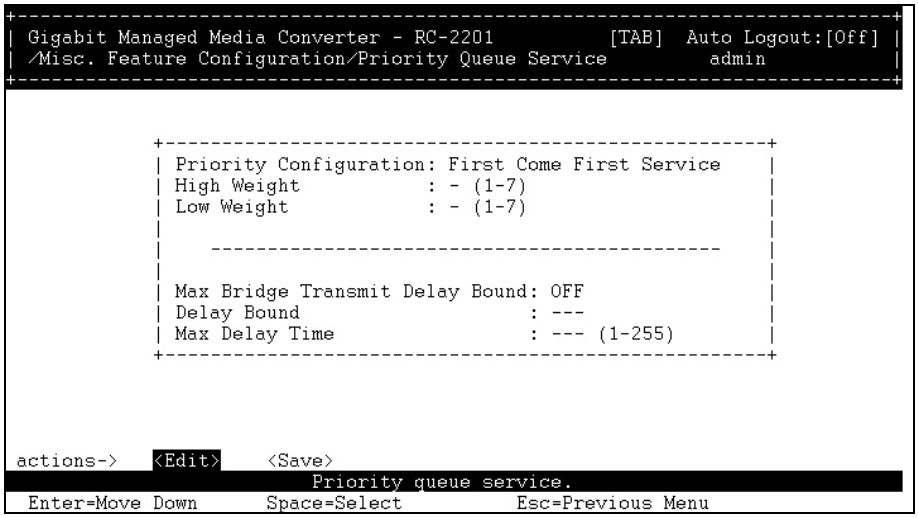

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Misc. Feature Configuration/Priority Queue Service
admin
Priority Configuration: First Come First Service
High Weight : - (1-7)
Low Weight : - (1-7)
Max Bridge Transmit Delay Bound: OFF
Delay Bound : ---
Max Delay Time : --- (1-255)
actions-> <Edit> <Save>
Priority queue service.
Enter=Move Down Space=Select Esc=Previous Menu

Fig. 4-34

Function name:

QoS Policy

Function Description:

It is used to assign which priority level is high or low. Normally, we map the priority levels 7 – 4 to be high priority and the priority levels 3 – 0 to be low priority. The mapped priority will be applied to the forwarding scheduler. In RC-2201/02, it's FCFS, Strict and WRR. The QoS policy is global.

Default: If enabled, priority levels 7 – 4 are assigned to be high priority, and priority levels 3 – 0 are assigned to be low priority.

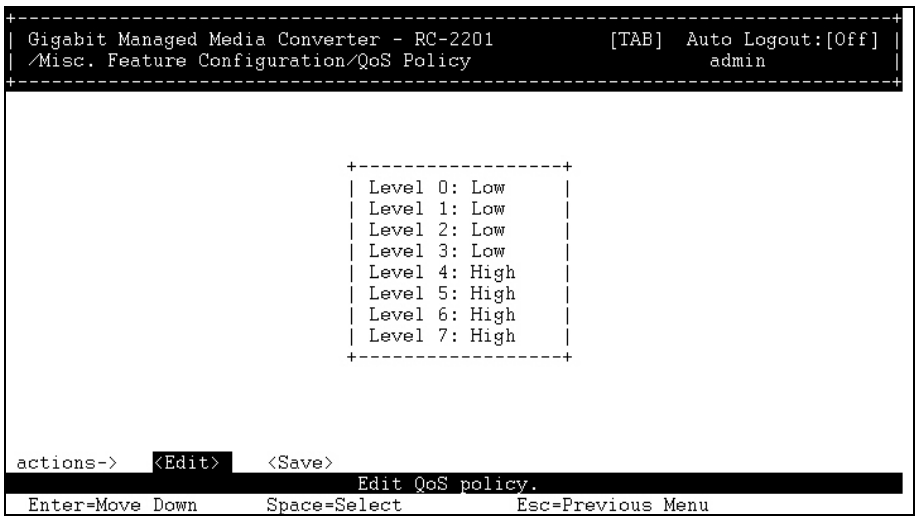


Fig. 4-35

4-4-7. Filtering Configuration

The filtering function in RC-2201/02 is used to filter unwanted MAC address from accessing the converter based on some simple rules. RC-2201/02 provides three types of filtering function for security configuration. They are Allowed Forwarding MAC Address, Port Security and Denied Forwarding MAC Address. You can configure it for different purposes of application. Here we list two examples for your reference.

Example 1:

Assumes administrator wishes a specified station can only access the converter from a specified port and the traffic from all other stations is rejected by that specified port. How should we configure RC-2201/02 for the case?

Solution:

First, enter the function “Allowed Forwarding MAC Address” to add an entry with the MAC address of the specified station on the Allowed Forwarding table of the specified port. The Security Port of the specified port should be then enabled in the “Port Security” function. Finishing these processes, the specified port will not allow any other station to access the converter except the specified station. And if this specified station is moved to other port, it cannot access the converter, either.

Example 2:

Assumes an administrator wishes to deny a specified station from accessing the converter, which is to isolate the specified station from the converter. How should we configure RC-2201/02 for the case?

Solution:

For denying a specified station, it is easy. You just have to use the function “Denied Forwarding MAC Address” to configure it. Enter this function and select the **<Create New Entry>** function to add the MAC address of the specified station, which is rejected to access the converter. The Deny Forwarding function is global. It is applied to the whole converter.

Function name:

Allowed Forwarding MAC Address

Function description:

Allowed Forwarding MAC Address is a function to allow the user in the Allowed Forwarding table to access a specified port of the converter. Allowed Forwarding table associated with a specified port of a converter is setup by manually inputting MAC address and its alias name. The data in the table is kept until RC-2201/02 is powered off. The traffic with the source MAC address listed in the Allowed Forwarding Table can only access the converter from the port associated. The MAC address associated with the specified port cannot access any other port of the converter. All of the above settings will take effect only when "Port Security Setting" function of the associated port is enabled.

For adding a MAC address entry in the allowed table, you just need to fill in three parameters: MAC address, associated port, and priority. Just enter its **<Delete Entry>** function, you also can remove the MAC address entry you want (See Fig.4-36).

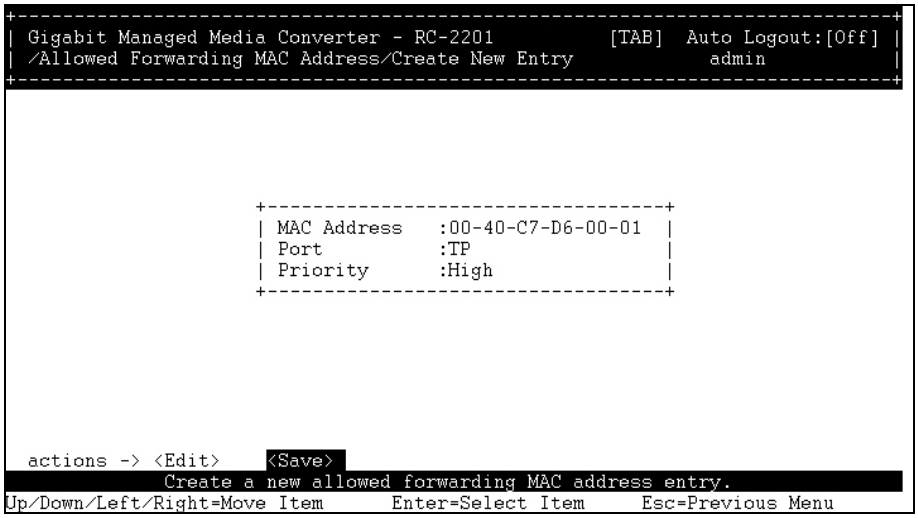


Fig. 4-36

Parameter description:

Create New Entry:

Add an allowed forwarding MAC address entry. It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 – 01

Port:

Port of RC-2201/02.

Priority:

This is for traffic priority. User can configure a MAC address high priority or low priority. If MAC address is configured high priority, the packet with that DA or SA will be put into the high priority queue and be transmitted with high priority. If MAC address is configured low priority, the packet with that MAC address will be transmitted with low priority.

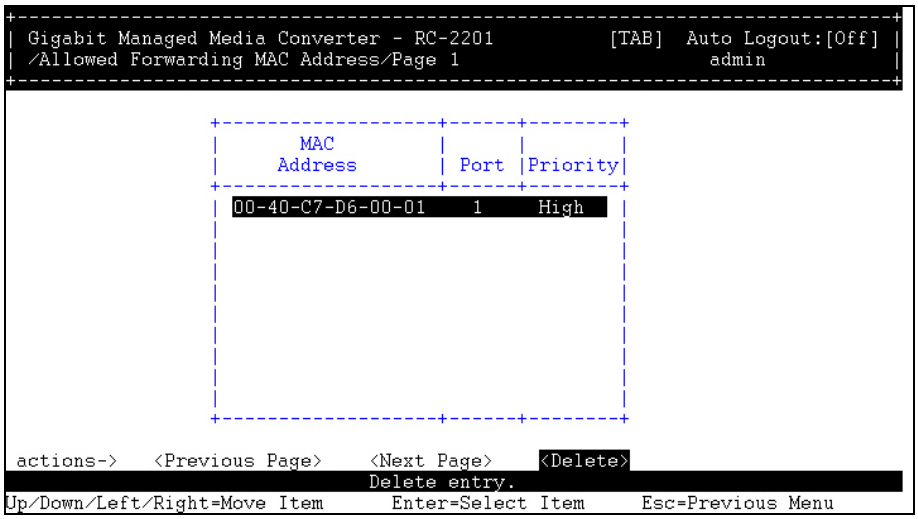


Fig. 4-37

Delete Entry:

Delete an entry from the allowed forwarding MAC address table.

Function name:

Port Security

Function description:

The usage of Port Security has to combine with Allowed Forwarding MAC Address function as mentioned above. In this function, you can enable it by pressing **<Space>** key in the port. If the user enables each port, then, the enabled port will stop learning MAC Address and block any incoming packet except that the packet with the MAC Address is listed in the Forwarding MAC Address table associated with that port. Move the cursor to **<Save>** and press **<Enter>** key, then the system will take effect immediately.

Fig. 4-38

Function name:

Denied Forwarding MAC Address

Function description:

Denied Forwarding MAC Address is a function that denies the packet forwarding if the packet's MAC Address is listed in the filtering MAC Address table. User can very easily maintain the table by filling in MAC Address field individually. User also can insert or delete each entry by entering its **<Create New Entry>** or **<Delete Entry>** function.

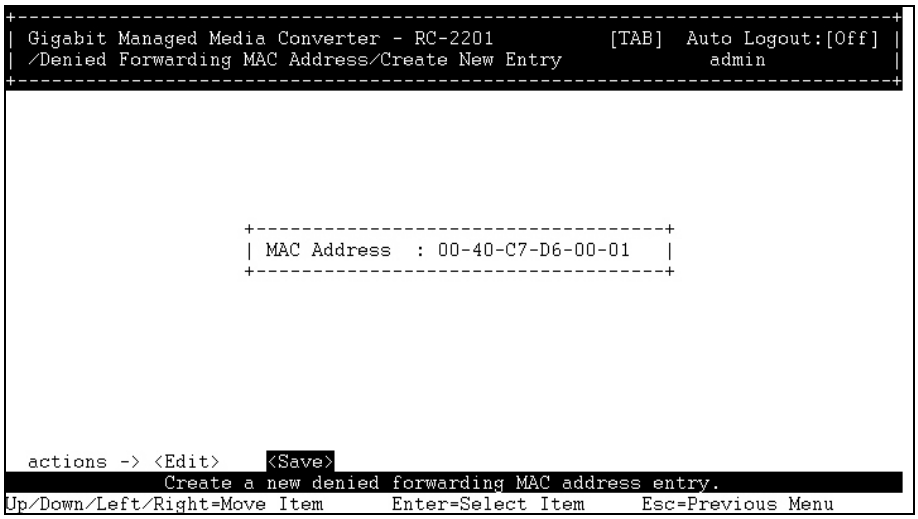


Fig. 4-39

Parameter description:

Create New Entry:

Add a denied forwarding MAC address entry.

MAC Address:

It is a six-byte long Ethernet hardware address and usually expressed by hex and separated by hyphens. For example,

00 – 40 - C7 - D6 – 00 - 01

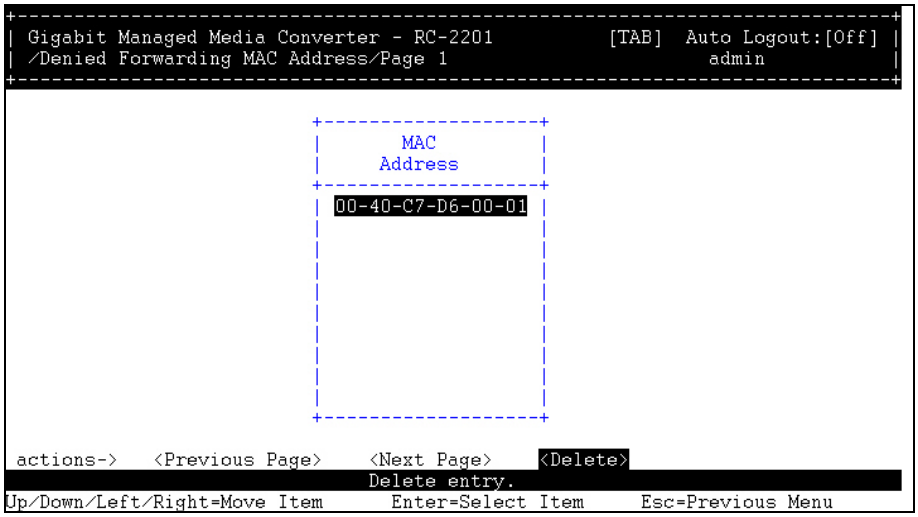


Fig. 4-40

Delete Entry:

Delete an entry from the denied forwarding MAC address table.

4-4-8. VLAN Configuration

VLAN configuration is used to partition your LAN into small ones as your demand. Properly configuring it, you can gain not only improving security and increasing performance but greatly reducing VLAN management.

RC-2201/02 supports Tag-based VLAN (802.1q) as well as protocol VLAN (802.1v). Tag-based VLAN (802.1q) also associates with GVRP for the management of dynamic tag-based VLAN. You can make VLAN configurations via the function VLAN Enable/Disable (VLAN Status) and VLAN Port VID Setting to configure VLAN parameters in the console management.

Function name:

VLAN Enable/Disable (VLAN Status)

Function description:

The VLAN Mode function includes two modes: Enable or Disable, you can choose one of them by pressing **<Space>** key. Then, move the cursor to **<Save>** and press **<Enter>** key, the setting will take affect immediately.

Parameter description:

VLAN Status:

Disable:

Stop VLAN function on RC-2201/02. In this mode, no VLAN is applied to RC-2201/02. This is the default setting.

Enable:

Effect VLAN function on RC-2201/02. In this mode, VLAN is applied to RC-2201/02.

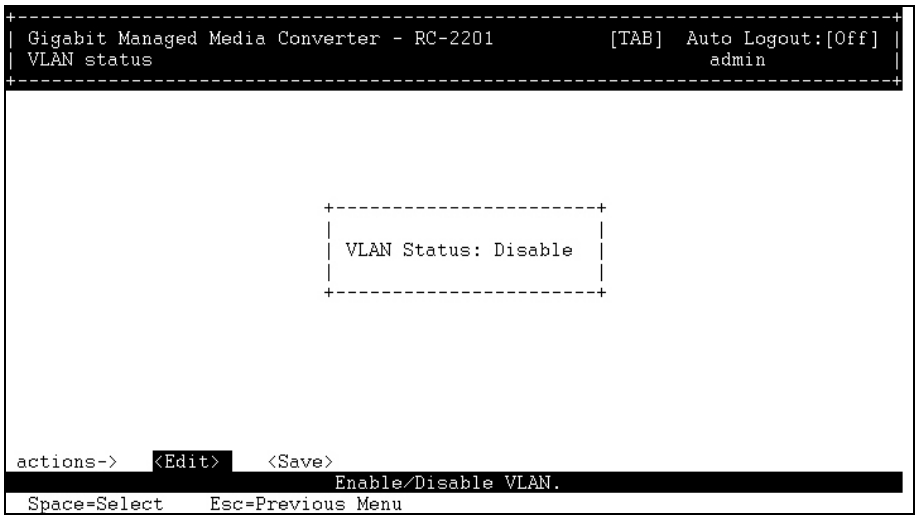


Fig. 4-41 VLAN Status

Function name:

VLAN Port VID Setting (for Tag Only)

Function description:

This design is concerning the CPE site customer, there are not VLAN aware network device for tagged based VLAN application. The RC-2201/02 plays the role of the edge of VLAN aware network with tagged packets for upstream and untagged for downstream.

Parameter description:

Port:

Port of RC-2201/02.

PVID:

In VLAN Port VID Setting, user can input VID number to each port. The range of VID is from 1 to 4094.

Default: 1

Tag:

The egress rule configuration is to make decision for packets tagging out or packets un-tagging out from the configured port.

Default: NO

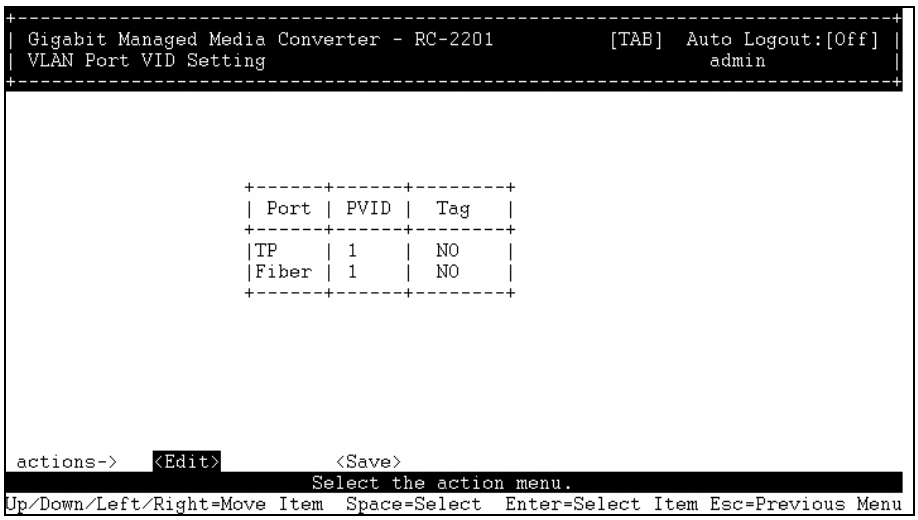

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
VLAN Port VID Setting
admin
Port | PVID | Tag
TP | 1 | NO
Fiber | 1 | NO
actions-> <Edit> <Save>
Select the action menu.
Up/Down/Left/Right=Move Item Space=Select Enter=Select Item Esc=Previous Menu

Fig. 4-42 VLAN Port VID Setting

4-4-9. Trap/Alarm Configuration

Function name:

Trap Events Configuration

Function description:

The Trap Events Configuration function is used to enable the Managed Media Converter to send out the trap information while pre-defined trap events occurred. RC-2201/02 offers 16 different trap events to users for converter management. The trap information can be sent out in three ways, including e-mail, mobile phone SMS (short message system) and Trap. Move the cursor to **<Edit>** and press **<Enter>** key, then the message will be sent while users tick (☑) the trap event individually by pressing **<Space>** key on the console management shown as below.

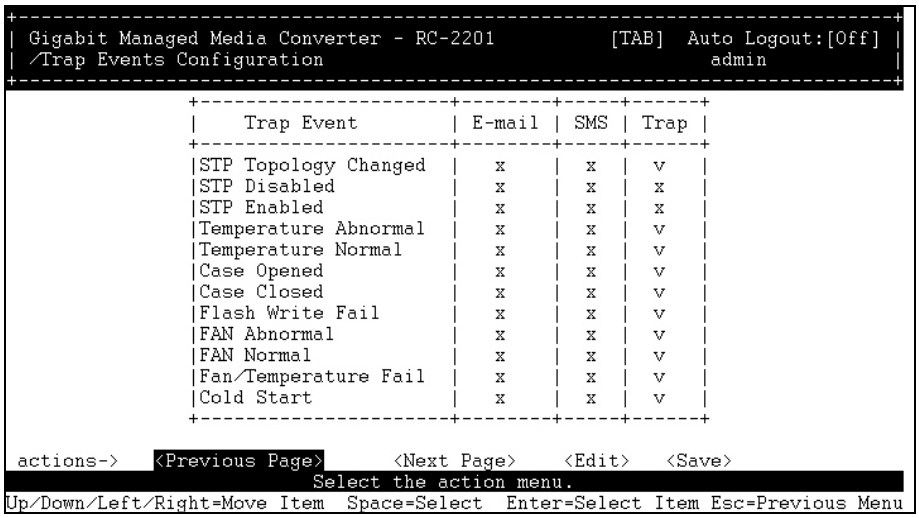

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Trap Events Configuration
admin
Trap Event | E-mail | SMS | Trap
STP Topology Changed | x | x | v
STP Disabled | x | x | x
STP Enabled | x | x | x
Temperature Abnormal | x | x | v
Temperature Normal | x | x | v
Case Opened | x | x | v
Case Closed | x | x | v
Flash Write Fail | x | x | v
FAN Abnormal | x | x | v
FAN Normal | x | x | v
Fan/Temperature Fail | x | x | v
Cold Start | x | x | v
actions-> <Previous Page> <Next Page> <Edit> <Save>
Select the action menu.
Up/Down/Left/Right=Move Item Space=Select Enter=Select Item Esc=Previous Menu

Fig. 4-43

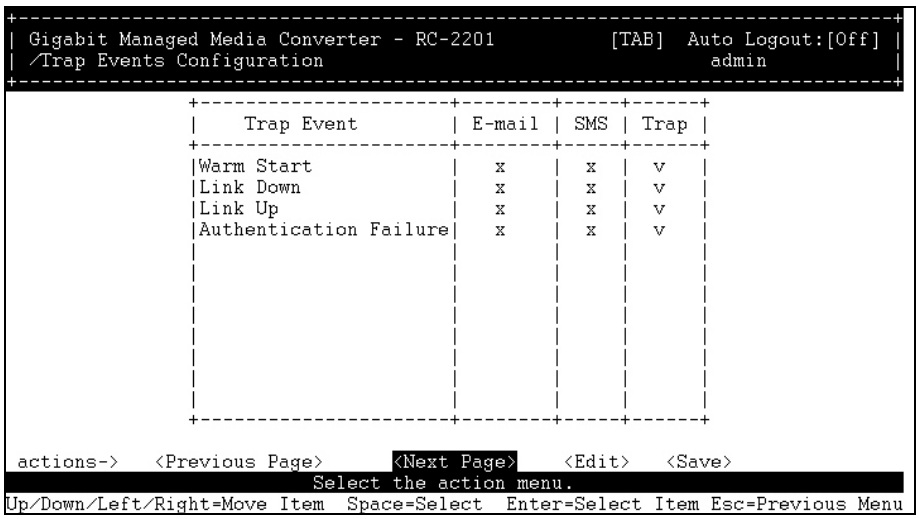

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Trap Events Configuration
admin
Trap Event | E-mail | SMS | Trap
Warm Start | x | x | v
Link Down | x | x | v
Link Up | x | x | v
Authentication Failure | x | x | v
actions-> <Previous Page> <Next Page> <Edit> <Save>
Select the action menu.
Up/Down/Left/Right=Move Item Space=Select Enter=Select Item Esc=Previous Menu

Fig. 4-44

Parameter description:

STP Topology Changed: E-mail, SMS and Trap

E-mail : Send “STP Topology Changed” alarm message by E-mail when the STP topology changed event happened.
Default: Unchecked (☐)

SMS : Send “STP Topology Changed” alarm message by Short Message System when the STP topology changed event happened. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the STP topology changed event happened.
Default: Checked (☑)

STP Disabled: E-mail, SMS and Trap

E-mail : Send “STP Disabled” alarm message by E-mail when the STP function was disabled.
Default: Unchecked (☐)

SMS : Send “STP Disabled” alarm message by Short Message System when the STP function was disabled.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the STP function was disabled.
Default: Unchecked (☐)

STP Enabled: E-mail, SMS and Trap

E-mail : Send “STP Enabled” alarm message by E-mail when the STP function was enabled.
Default: Unchecked (☐)

SMS : Send “STP Enabled” alarm message by Short Message System when the STP function was enabled.
Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the STP function was enabled.
Default: Unchecked (☐)

Temperature Abnormal: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS, when the RC-2201/02's case inside temperature was over 50°C or under 4°C. The default setting is shown as below:

E-mail : Send "Temperature Abnormal" alarm message by E-mail when the case inside temperature over 52°C or under 4°C. Default: Unchecked (☐)

SMS : Send "Temperature Abnormal" alarm message by Short Message System when the case inside temperature over 52°C or under 4°C. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the case inside temperature over 52°C or under 4°C. Default: Checked (☑)

Temperature Normal: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS, when the RC-2201/02's case inside temperature recover from (over 52°C or under 4°C) to under (48°C and over 4°C). The default setting is shown as below:

E-mail : Send "Temperature Normal" alarm message by E-mail when the case inside temperature recover to normal status. Default: Unchecked (☐)

SMS : Send "Temperature Normal" alarm message by Short Message System when the case inside temperature recover to normal status. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the case inside temperature recover to normal status. Default: Checked (☑)

Case Opened: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS, when the RC-2201/02's case was opened. The default setting is shown as below:

E-mail : Send "Case Opened" alarm message by E-mail when case is opened. Default: Unchecked (☐)

SMS : Send "Case Opened" alarm message by Short Message System when case is opened. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when case is opened. Default: Checked (☑)

Case Closed: E-mail, SMS and Trap

Issue alarm message via E-mail and SMS, when the RC-2201/02's case was closed. The default setting is shown as below:

E-mail : Do not send "Case Closed" alarm message by E-mail when case is closed. Default: Unchecked (☐)

SMS : Do not send "Case Closed" alarm message by Short Message System when case is closed. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when case is closed. Default: Checked (☑)

Flash Write Fail: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device happen "Flash Write Fail" event. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device happen "Flash Write Fail" event. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device happen "Flash Write Fail" event. Default: Checked (☑)

FAN Abnormal: E-mail, SMS and Trap

E-mail : Send "FAN Abnormal" alarm message by E-mail when the FAN was abnormal. Default: Unchecked (☐)

SMS : Send "FAN Abnormal" alarm message by Short Message System when the FAN was abnormal. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the FAN was abnormal. Default: Checked (☑)

FAN Normal: E-mail, SMS and Trap

E-mail : Send "FAN Normal" alarm message by E-mail when the FAN was normal. Default: Unchecked (☐)

SMS : Send "FAN Normal" alarm message by Short Message System when the FAN was normal. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the FAN was normal. Default: Checked (☑)

FAN/Temperature Fail: E-mail, SMS and Trap

E-mail : Send “FAN/Temperature Fail” alarm message by E-mail when the FAN was abnormal and Temperature was over 60°C at the same time. Default: Unchecked (☐)

SMS : Send “FAN/Temperature Fail” alarm message by Short Message System when the FAN was abnormal and Temperature was over 60°C at the same time. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the FAN was abnormal and Temperature was over 60°C at the same time. Default: Checked (☑)

Cold Start: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device happen restart event by cold booting method. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device happen restart event by cold booting method. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device happen restart event by cold booting method. Default: Checked (☑)

Warm Start: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device happen restart event by warm booting method. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when he device happen restart event by warm booting method. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when he device happen restart event by warm booting method. Default: Checked (☑)

Link Down: E-mail, SMS and Trap

Default setting is as below:

E-mail : Send alarm message by E-mail when the device Ethernet port happen link down event. Default: Unchecked (☐)

SMS : Send short message to mobile phone when the device Ethernet port happen link down event. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device Ethernet port happen link down event. Default: Checked (☑)

Link Up: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device Ethernet port happen link up event. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device Ethernet port happen link up event. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device Ethernet port happen link up event. Default: Checked (☑)

Authentication Failure: E-mail, SMS and Trap

Default setting is as below:

E-mail : Do not send alarm message by E-mail when the device received a SNMP get or set request with a wrong community name. Default: Unchecked (☐)

SMS : Do not send short message to mobile phone when the device received a SNMP get or set request with a wrong community name. Default: Unchecked (☐)

Trap : Send Trap message to SNMP Trap Receiver when the device received a SNMP get or set request with a wrong community name. Default: Checked (☑)

Function name:

Alarm Configuration

Function description:

Alarm configuration is used to configure the persons who should receive the alarm message via either email or SMS, or both. It depends on your settings. An email address or a mobile phone number has to be set in the console management of alarm configuration (See Fig. 4-45~4-46). Then, user can read the trap information from the email or the mobile phone. This function provides 6 email addresses and 6 mobile phone numbers at most. The 16 different trap events will be sent out to SNMP Manager when trap event occurs. After ticking trap events, you can fill in your desired email addresses and mobile phone numbers. Then, move the cursor to **<Save>** and press **<Enter>** key to complete the alarm configuration. It will take effect in a few seconds.

Note: SMS may not work in your mobile phone system. It is customized for different systems.

Parameter description:

Email:

Mail Server: the IP address of the server transferring your email.

Username: your username on the mail server.

Password: your password on the mail server.

Email Address 1 – 6: email address that would like to receive the alarm message.

SMS:

SMS Server: the IP address of the server transferring your SMS.

Default: 203.66.172.131

Username: your username in ISP.

Password: your username in ISP.

Mobile Phone 1-6: the mobile phone number that would like to receive the alarm message.

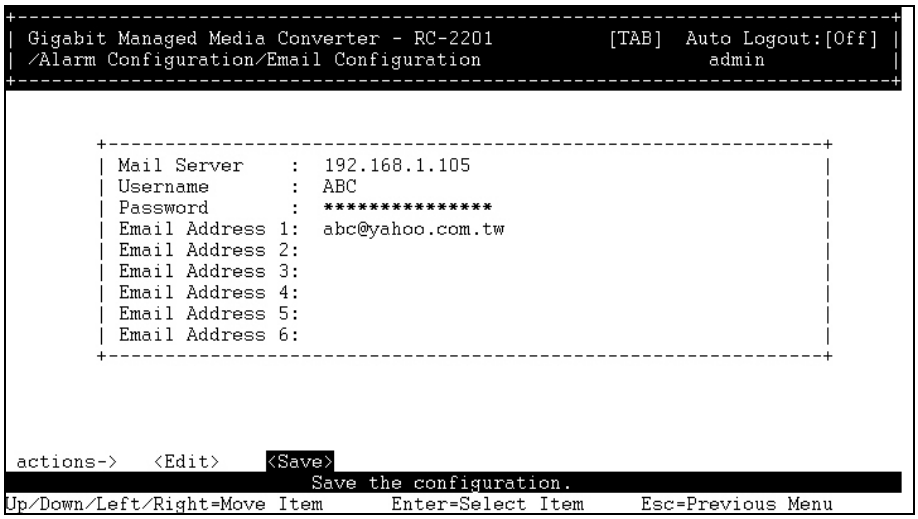


Fig. 4-45

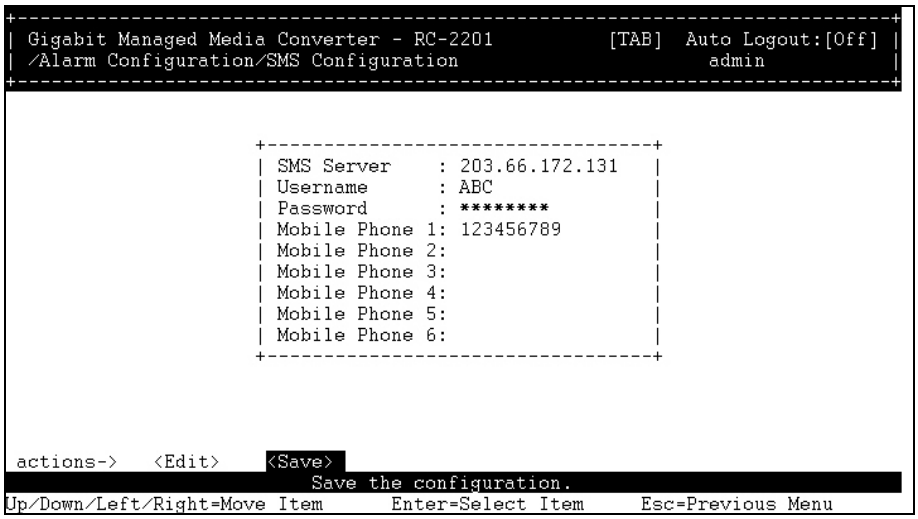


Fig. 4-46

4-4-10. Save Configuration

RC-2201/02 supports three copies of configuration, including default configuration, working configuration and user configuration for your configuration management. All of them are listed and described below respectively.

- **Default Configuration:**

  This is the ex-factory setting and cannot be altered.

- **Working Configuration:**

  It is the configuration you are using currently and can be changed any time. The configurations you are using are saved into this configuration file. This is updated each time as you select **<Save>** item.

- **User Configuration:**

  It is the configuration file for the specified or backup purposes and can be updated while having confirmed the configuration. You can retrieve it by performing Restore User Configuration.

Function name:

Save As User Configuration

Function description:

Save As User Configuration function can save the current configuration as a user configuration file in flash memory.

Fig. 4-47

Function name: Restore Default Configuration

Function description:

Restore Default Configuration function can retrieve the ex-factory setting to replace the working configuration.

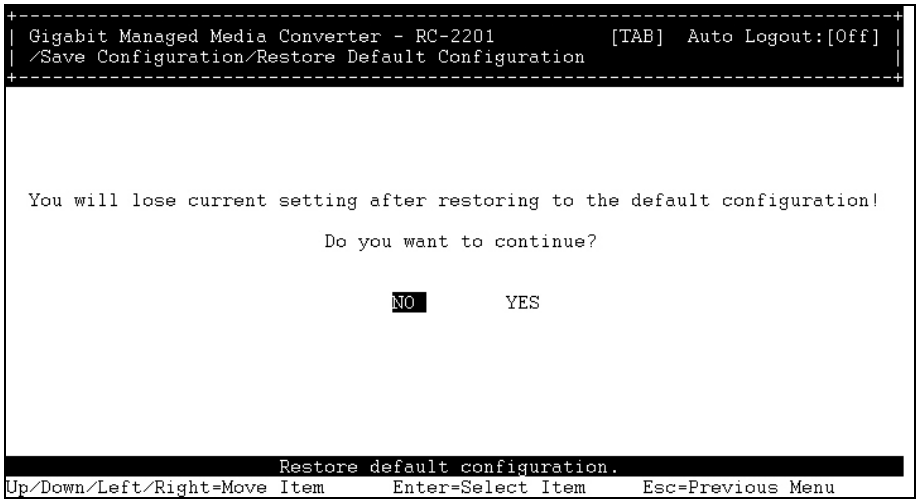

Gigabit Managed Media Converter - RC-2201 [TAB] Auto Logout:[Off]
/Save Configuration/Restore Default Configuration
You will lose current setting after restoring to the default configuration!
Do you want to continue?
NO YES
Restore default configuration.
Up/Down/Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-48

Function name: Restore User Configuration

Function description:

Restore User Configuration function can retrieve the previous confirmed working configuration stored in the flash memory to update user's current working configuration. When completing to restore the configuration, the system's working configuration is updated and will be changed its working mode by the new configuration immediately.

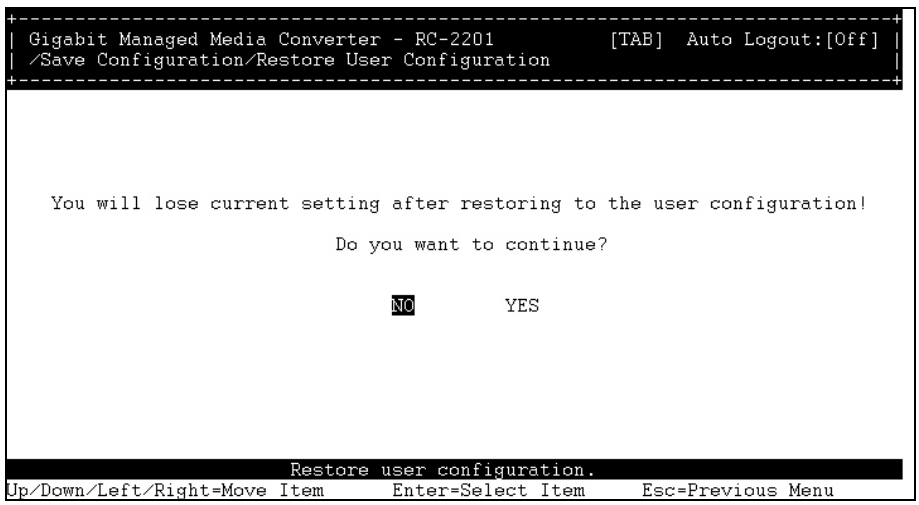

Gigabit Managed Media Converter - RC-2201 [TAB] Auto Logout:[Off]
/Save Configuration/Restore User Configuration
You will lose current setting after restoring to the user configuration!
Do you want to continue?
NO YES
Restore user configuration.
Up/Down/Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-49

4-5. Diagnostics

Function name:

Diagnostics

Function description:

Diagnostics function provides a set of basic system diagnosis. It let users know that whether the system is health or needs to be fixed. The basic system check includes UART test, DRAM test, Flash test, Temperature detection, Case detection and Fan RPM detection.

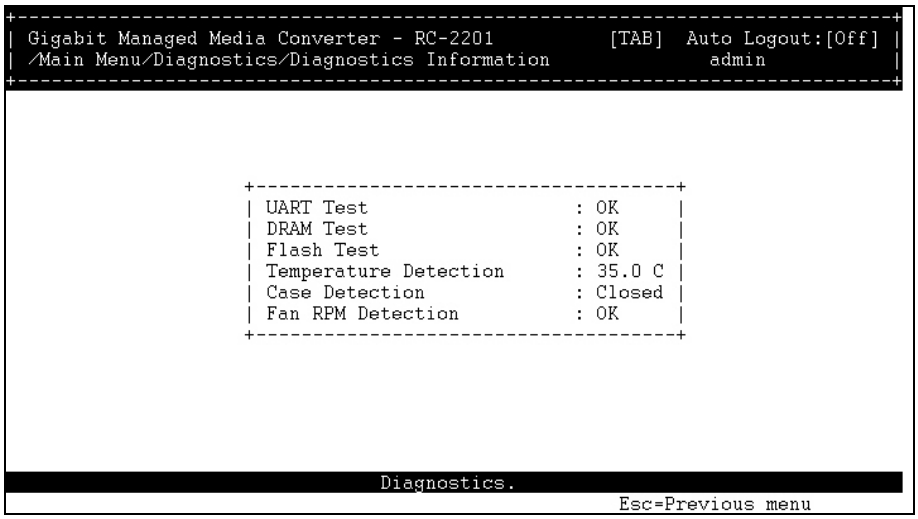


Fig. 4-50

Function name:

Loopback Test

Function description:

In the Loopback Test function, there are two different loopback tests. One is Internal Loopback Test and the other is External Loopback Test. The former test function will not send the test signal outside the RC-2201/02 converter box. The test signal only wraps around in the RC-2201/02 converter box. As to the latter test function, it will send the test signal to its link partner. If you do not have them connected to active network devices, i.e. the ports are link down, RC-2201/02 will report the port numbers failed. If they all are ok, it just shows OK.

Note: Whatever you choose Internal Loopback Test or External Loopback Test, these two functions will interfere with the normal system working, and all packets in sending and receiving also will stop temporarily.

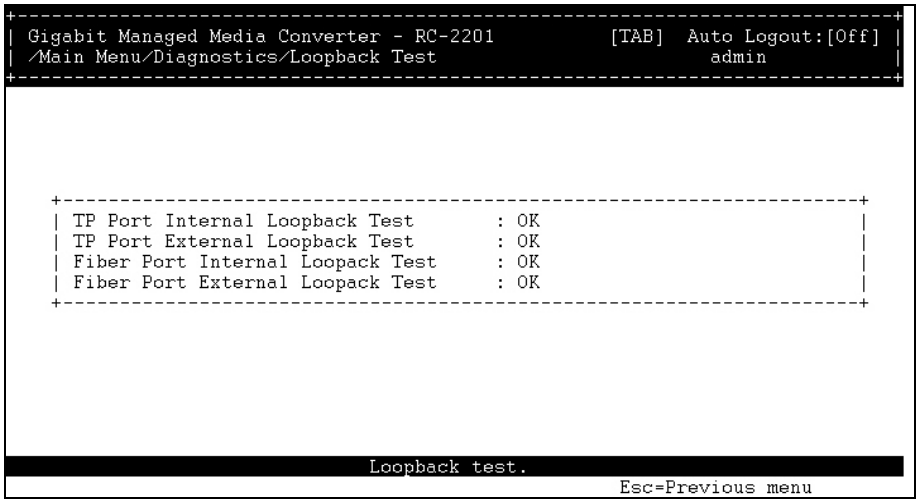

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[Off]
/Main Menu/Diagnostics/Loopback Test
admin
TP Port Internal Loopback Test : OK
TP Port External Loopback Test : OK
Fiber Port Internal Loopack Test : OK
Fiber Port External Loopack Test : OK
Loopback test.
Esc=Previous menu

Fig. 4-51

Function name: Ping Test

Function description:

Ping Test function is a tool for detecting if the target device is alive or not through ICMP protocol which abounds with report messages. RC-2201/02 provides Ping Test function to let you know that if the target device is available or not. You can simply fill in a known IP address and then press **<Enter>** key. After a few seconds later, RC-2201/02 will report you the pinged device is alive or dead in Ping Result.

Parameter description:

IP Address: an IP address with the version of v4, e.g. 192.168.1.1.

Gateway: IP address of the default gateway.

For more details, please see the section of IP address in Chapter 2.

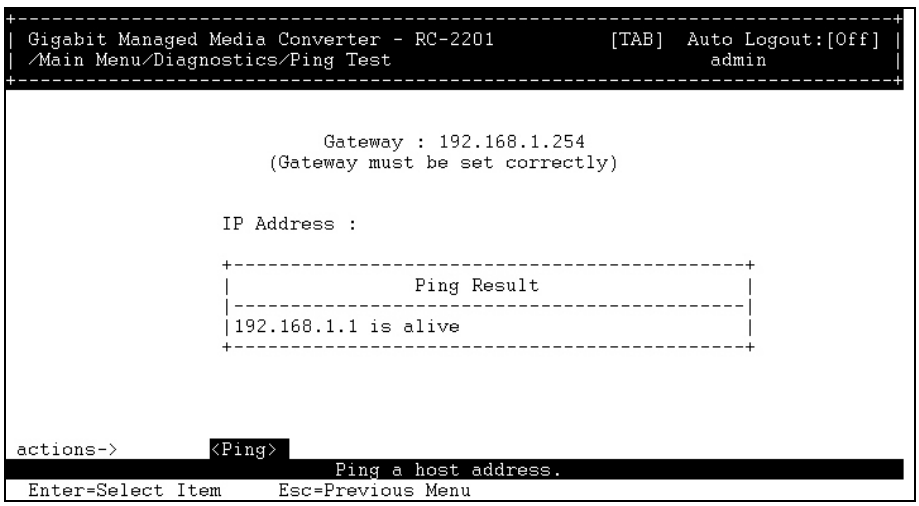


Fig. 4-52

Function name:

Auto Ping Configuration

Function description:

Auto Ping Configuration is used to test one or two target devices periodically with a period of time, which is programmable. This can detect that if the target device or the device itself is dead, and it helps you debug the network problems. RC-2201/02 can auto-ping two network devices at the same time.

Parameter description:

Ping Time Interval:

This parameter is used to instruct RC-2201/02 periodically pinging the target device with the time interval you assigned. Programmable time range: 1 – 60 minutes. Default: 10 minutes.

Host and Gateway:

These are IP addresses with the format of version 4. For more information, please see the section of IP address in Chapter 2.

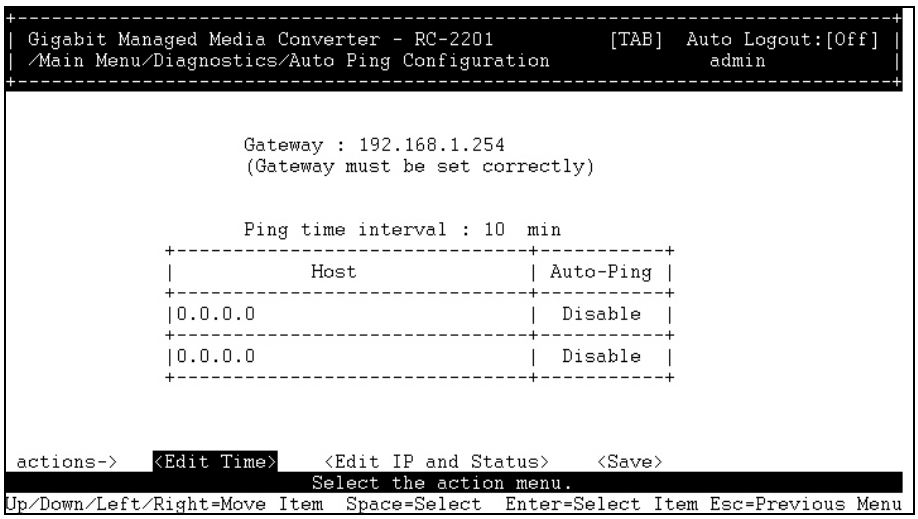


Fig. 4-53

4-6. Show Log Data

This function shows the log data. RC-2201/02 provides one type of trap log data for users. There are 11 private trap logs and 5 public trap logs. RC-2201/02 supports total 120 log entries. For more details on log items, please refer to the section of Trap/Alarm Configuration and SNMP Configuration. User logs include user login and logout.

Function name:

Trap Log Data

Function description:

The Trap Log Data is displaying the log items including all SNMP Private Trap events, SNMP Public traps and user logs occurred in the system. In the report table, No, Time and Events are three fields contained in each trap record.

Parameter description:

No:

Display the order number that the trap happened.

Time:

Display the time that the trap happened.

Events:

Display the trap event name.

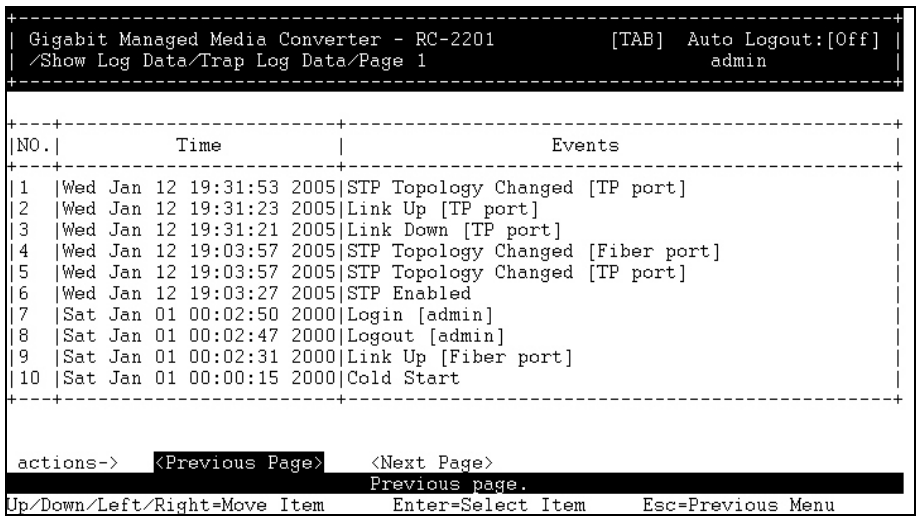

Gigabit Managed Media Converter - RC-2201 [TAB] Auto Logout:[Off]
/Show Log Data/Trap Log Data/Page 1 admin
NO. Time Events
1 Wed Jan 12 19:31:53 2005 STP Topology Changed [TP port]
2 Wed Jan 12 19:31:23 2005 Link Up [TP port]
3 Wed Jan 12 19:31:21 2005 Link Down [TP port]
4 Wed Jan 12 19:03:57 2005 STP Topology Changed [Fiber port]
5 Wed Jan 12 19:03:57 2005 STP Topology Changed [TP port]
6 Wed Jan 12 19:03:27 2005 STP Enabled
7 Sat Jan 01 00:02:50 2000 Login [admin]
8 Sat Jan 01 00:02:47 2000 Logout [admin]
9 Sat Jan 01 00:02:31 2000 Link Up [Fiber port]
10 Sat Jan 01 00:00:15 2000 Cold Start
actions-> <Previous Page> <Next Page>
Previous page.
Up/Down/Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-54

Function name:

Enable/Disable (Illegal Access Report Status)

Function description:

User can select “Enable” or Disable” the illegal access report function. If select disabled illegal access report, the illegal access report will not log any illegal access events. If select enabled illegal access report, the illegal access events will be logged.

Parameter description:

Illegal Access Report Status:

You can enable/disable the mode of illegal access report.

Default: Enable.

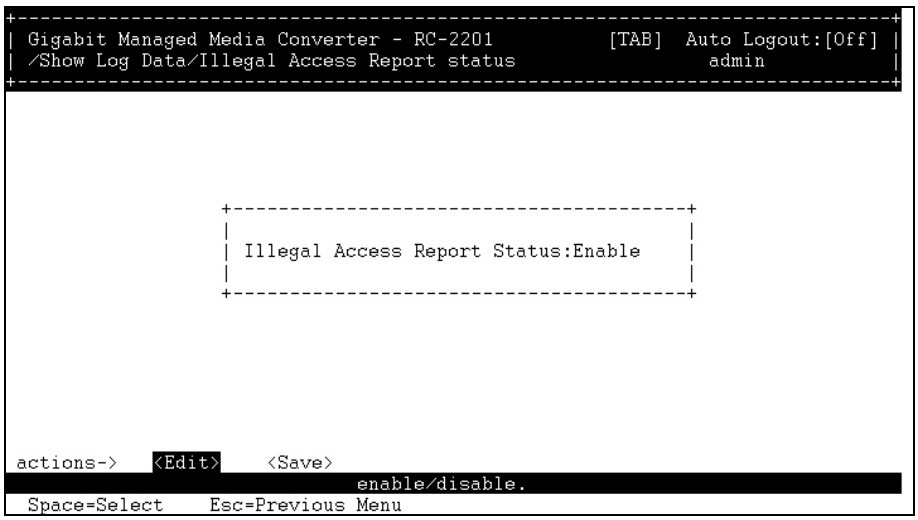


Fig. 4-55

Function name:

Display Illegal Access Report

Function description:

The Display Illegal Access Report function is to display the unauthorized users accessing RC-2201/02. If Allowed forwarding or Denied forwarding was configured, Illegal Access Report starts recording which illegal user(s) try to access. At this moment, illegal users will be rejected to serve in RC-2201/02. This can highly improve network security and traffic management.

In this table, RC-2201/02 records those users who violate Allowed Forwarding rule and Denied Forwarding rule. Besides, illegal access report can also show the alias name of users, instead of MAC address only, if you configured MAC alias name in advance.

Each entry in illegal access report comprises five fields, including Source Address, Destination Address, port, time and reason. RC-2201/02 supports 32 record entries for illegal access report by applying ring structure. That means if there is no room for the new record, it will overwrite the oldest record in the ring.

Parameter description:

Source Address: MAC Source Address.

Destination Address: MAC Destination Address.

Port: Display the port that the illegal access happened.

Time: Current System Time.

Reason: Violating Allowed Table or Violating Denied Table.

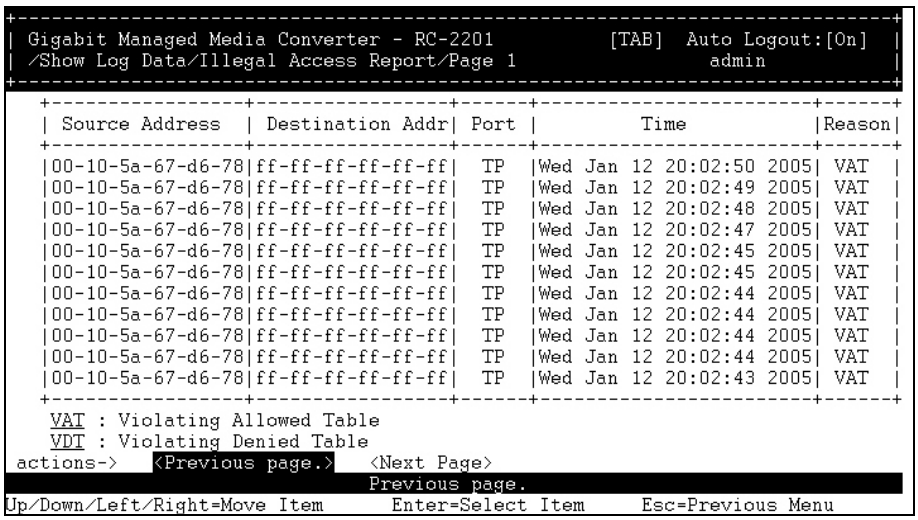

Gigabit Managed Media Converter - RC-2201
[TAB] Auto Logout:[On]
/Show Log Data/Illegal Access Report/Page 1
admin
Source Address | Destination Addr | Port | Time | Reason
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:50 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:49 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:48 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:47 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:45 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:45 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:44 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:44 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:44 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:44 2005| VAT
00-10-5a-67-d6-78|ff-ff-ff-ff-ff-ff| TP |Wed Jan 12 20:02:43 2005| VAT
VAT : Violating Allowed Table
VDT : Violating Denied Table
actions-> <Previous page.> <Next Page>
Previous page.
Up/Down/Left/Right=Move Item Enter=Select Item Esc=Previous Menu

Fig. 4-56

Function name:

MAC Alias

Function description:

MAC Alias function is used to let you assign MAC address a plain English name, which will help you tell which MAC address belongs to which user in the illegal access report. At the initial time, it shows all pairs of the existed alias name and MAC address.

There are three MAC alias functions in this function folder, including Create New Entry, Edit/ Delete Entry. You can add a new alias name for a specified MAC address in Create New Entry function, or mark an existed entry to edit/delete it in Edit/ Delete Entry function as well. Alias name must be composed of A-Z, a-z and 0-9 only and has a maximal length of 17 characters.

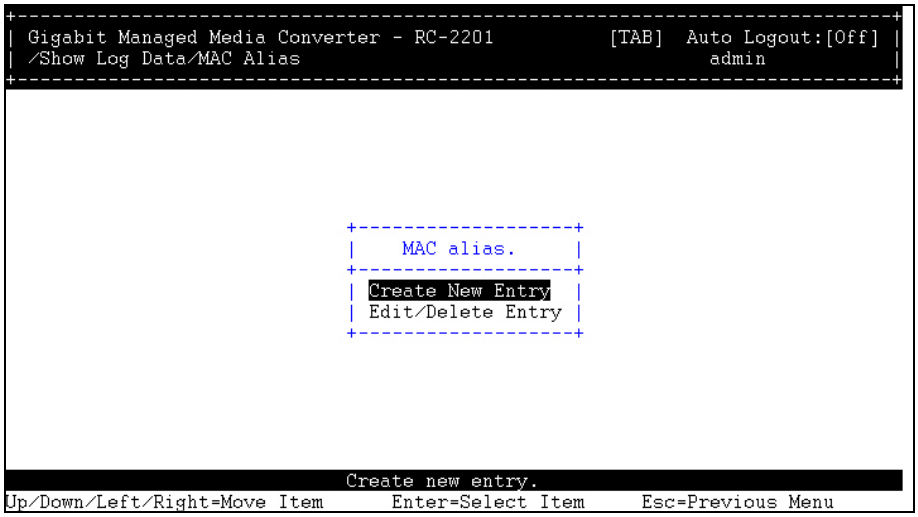


Fig. 4-57

Function name:

Create New Entry

Function description:

In the MAC Alias function, it is used to let you add an association between MAC address and a plain English name. User can move the cursor to **<Edit>** and press **<Enter>** key to add a new record with name.

Parameter description:

MAC Address:

New Entry:

If you want to apply a name to a MAC address which does not exist in the MAC address table, you must choose New Entry to fill in the MAC address by yourself or select a MAC address in the MAC address table, and then assign it an alias name for mnemonic name.

Alias:

MAC alias name you assign.

Note: If there are too many MAC addresses learned in the table, we recommend you inputting the MAC address and alias name directly.

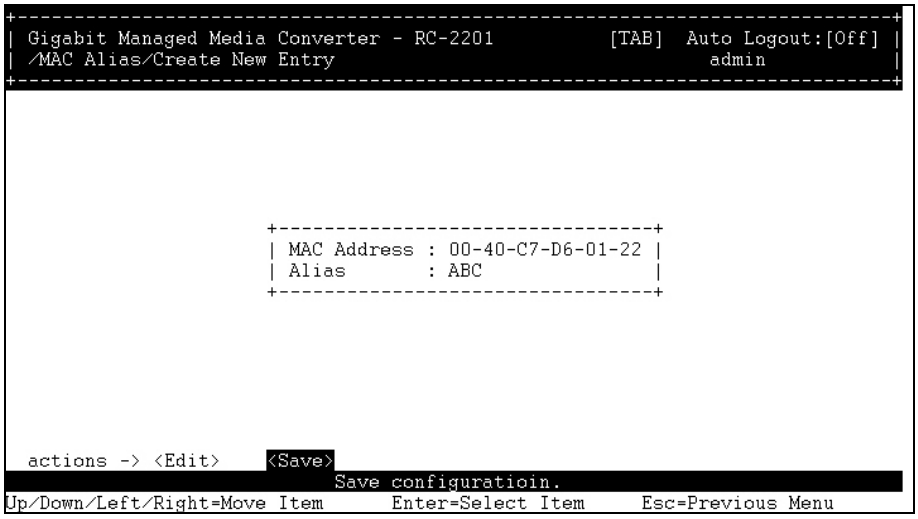


Fig. 4-58

Function name:

Edit/Delete Entry (MAC Alias)

Function description:

MAC Alias Edit/Delete function is used to let you modify/remove an alias name to a MAC address. You can select an existed MAC address or alias name to modify/remove.

Parameter description:

MAC Address:

The Ethernet MAC address of end station.

Alias:

A mnemonic name for the end station.

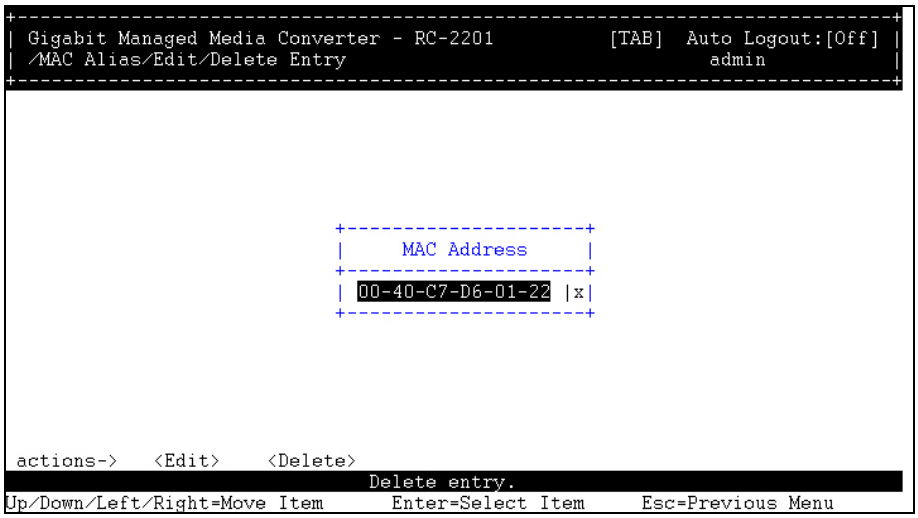


Fig. 4-59

4-7. Software Upgrade

Software upgrade tool is used to help upgrade the software function in order to fix or improve the function. RC-2201/02 provides a TFTP client for software upgrade. This can be done through Ethernet. For more details about upgrade procedures, please refer to Appendix D.

Function name: Software Upgrade

Function description:

RC-2201/02 supports TFTP upgrade tool for upgrading software. If you assure to upgrade software to a newer version one, you must follow two procedures:

1.) Specifying the IP address where TFTP server locates. In this field, the IP address of your TFTP server should be filled in.

2.) Specifying what the filename and where the file is. You must specify full path and filename.

Once you select **<Upgrade>** item, RC-2201/02 will prompt the screen for you to reconfirm. Then, RC-2201/02 starts downloading software from TFTP server if you choose **<Yes>**. It will be just back to "Software Upgrade" if you choose **<No>**. If your download is not successful, RC-2201/02 will also be back to "Software Upgrade", and it will not upgrade the software as well.

When download is completed, RC-2201/02 starts upgrading software. A reboot message will be prompted after completing upgrading software. At this time, you must reboot RC-2201/02 to have new software worked.

Note: Software upgrade is hazardous if power is off. You must do it carefully.

Parameter description:

TFTP Server IP Address: A TFTP server stored the image file you want to upgrade.

Path and Filename: File path and filename stored the image file you want to upgrade.

Fig. 4-60

4-8. Reboot

We offer you many ways to reboot RC-2201/02, including power up, hardware reset and software reset. You can press the RESET button in the front panel to reset RC-2201/02. After upgrading software, changing IP configuration or changing VLAN mode configuration, then you must reboot to have the new configuration taken effect. Here we are discussing is software reset for the “reboot” in the main menu.

Function name:

Reboot

Function description:

Reboot RC-2201/02. Reboot takes the same effect as the RESET button in the front panel of RC-2201/02 converter. It will take around thirty (30) seconds to complete the system boot.

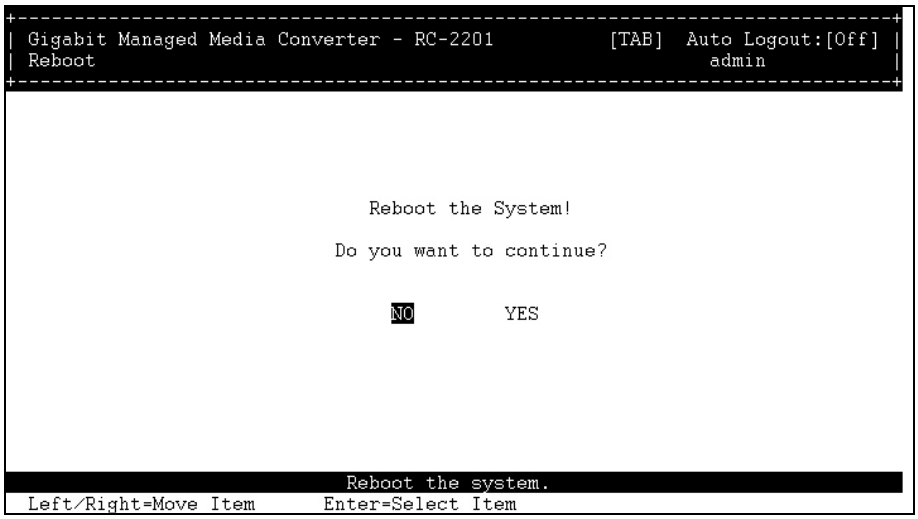


Fig. 4-61

4-9. Logout

You can manually logout by performing Logout function. In RC-2201/02, it provides another way to logout. You can configure it to logout automatically.

Function name:

Logout

Function description:

RC-2201/02 allows you to logout the system to prevent other users from the system without the permission. If you do not logout and exit the browser, RC-2201/02 will automatically have you logout. Besides this manually logout and implicit logout, you can press **<Tab>** to explicitly ON/OFF this logout function at the right-top corner.

Parameter description:

Auto Logout:

Select On/OFF. Default is ON. If it is "ON", and no action and no key is stroke as well in any function screen more than 3 minutes, RC-2201/02 will have you logout automatically.

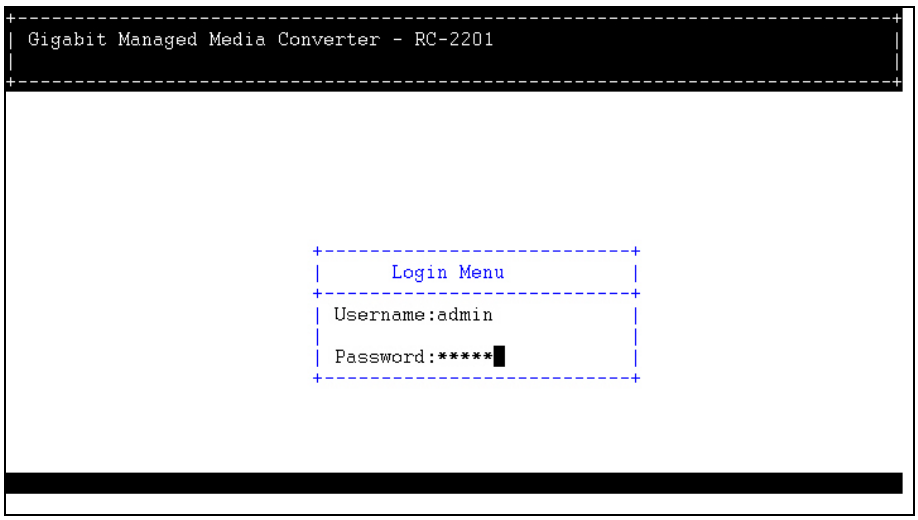


Fig. 4-62

5. Maintenance

5-1. Resolving No Link Conditions

The possible causes for a no link LED status are as follows:

- The attached device is not powered on
- The cable may not be the correct type or is faulty
- The installed building premise cable is faulty
- The port may be faulty

5-2. Q&A

1. Computer A can connect to Computer B, but cannot connect to Computer C through the RC-2201/02 Converter.
   - ✓ The network device of Computer C may fail to work. Please check the link/act status of Computer C on the LED indicator. Try another network device on this connection.
   - ✓ The network configuration of Computer C may be something wrong. Please verify the network configuration on Computer C.

2. The uplink connection function fails to work.
   - ✓ The connection ports on another must be connection ports. Please check if connection ports are used on that converter.
   - ✓ Please check the uplink setup of the RC-2201/02 Converter to verify the uplink function is enabled.

3. The console interface cannot appear on the console port connection.
   - ✓ The COM port default parameters are [Baud Rate: 57600, Data Bits: 8, Parity Bits: None, Stop Bit: 1, Flow Control: None]. Please check the COM port property in the terminal program. And if the parameters are changed, please set the COM configuration to the new setting.
   - ✓ Check the RS-232 cable is connected well on the Console port of the RC-2201/02 Converter and COM port of PC.
   - ✓ Check if the COM of the PC is enabled.

4. How to configure the RC-2201/02 Converter?
   - ✓ The “Hyperterm” is the terminal program in Win95/98/NT. Users can also use any other terminal programs in Linux/Unix to configure the converter. Please refer to the user guide of that terminal program. But the COM port parameters (baud rate/ data bits/ parity bits/ flow control) must be the same as the setting of the console port of the RC-2201/02 Converter.

Appendix A
Technical Specifications

Features

- One 10/100/1000M UTP port and one 1000M fiber port, which is able to support kinds of fiber
- Embeds management information in the bit stream
- DB-9 RS-232 console port
- Auto-discover NMS to get the configurations
- Supports the detection of Case Intrusion, Fan, Temperature and Power voltage
- Supports Software Power Switch; CPU can turn off the machine when no fan is detected and the case inside temperature is higher than 60 ˚C
- Physical media loop-back capability
- LED display: Power, CPU/Loop; UTP port: Link1000, Act, duplex/col; Fiber port: Link/ Act
- External Power adapter, 5V, 3A
- Management :
  - Supports Embedded Web Server (HTTP 1.1) for web-based management
  - Supports Embedded Telnet Server (RFC 1572, 854) for Telnet interface
  - Supports Serial (RS-232) Text-based menu-driven management
  - Supports SNMP V1 (RFC 1157) for SNMP management
  - Supports SNMP standard Traps and Alarm
  - Supports E-mail client (SMTP RFC 821) and Mobile Phone short message (SMS) for sending Traps and Alarm message
  - Be able to enable and disable any specific trap or alarm function
  - Supports DHCP (RFC 2131) Client and ICMP (RFC 792)
  - Supports MIB-II (RFC 1213), Private MIB
  - Supports Bandwidth rating management
  - Supports port enabled/disabled
  - Supports user login management
  - Supports TFTP (RFC 783) for on-line upgrade

Publication date: January, 2007
Revision A2

Hardware Specification

Physical Characteristics	
Ports	One 10/100/1000M RJ-45 UTP port, One 1000M fiber port with MM/SM, SC and other type of connector
Console Port	DB9 console port
Dimensions	141W x 96D x 44H mm
Input Power	5V +- 5%, 3A from external power adapter
Power Consumption	12.6 Watts maximum
Flash	4M bytes
CPU Main Memory	16M bytes
MAC Address and Self-learning	8K
Packet Buffer Memory	Up to 48K
Flow Control	Backpressure for half duplex, IEEE802.3x for full duplex
LED Display	TP Port : Link1000, Activity, FDX/COL Fiber Port : Link/Activity Device : Power, CPU/Loop
Management Support	
Management	In-Band : Web-Based, SNMP, Telnet; Out-Band : RS-232 Console
SNMP Management Agent	MIB II(RFC 1213),Private MIB
Software Upgrade	TFTP
Standards Conformance	
Environmental Temperature	Operating: 0 ~ 50°C, Storage: -20 ~ 70°C
Humidity	5% ~ 95%
Standards	IEEE802.3, IEEE802.3u, IEEE802.3x, IEEE802.3z

Ordering Information

Model Numbers	Description
RC-2201SC.S10	Stand alone 2-port Giga, SC, 10Km converter
RC-2201SC.S30	Stand alone 2-port Giga, SC, 30Km converter
RC-2201SC.S50	Stand alone 2-port Giga, SC, 50Km converter
RC-2201SC	Stand alone 2-port Giga, SC, MM converter
RC-2201BS5.S20	Stand alone 2-port G, Bidi SC, 20Km type1 converter
RC-2201BS3.S20	Stand alone 2-port G, Bidi SC, 20Km type2 converter
RC-2202SC.S10	Stand alone 2-port Giga, SC, 10Km converter with battery
RC-2202SC.S30	Stand alone 2-port Giga, SC, 30Km converter with battery
RC-2202SC.S50	Stand alone 2-port Giga, SC, 50Km converter with battery
RC-2202SC	Stand alone 2-port Giga, SC, MM converter with battery
RC-2202BS5.S20	Stand alone 2-port G, Bidi SC, 20Km type1 converter with battery
RC-2202BS3.S20	Stand alone 2-port G, Bidi SC, 20Km type2 converter with battery

Standard Technical Specification

Standard Network Connections

Twisted-Pair Port Interface	
▪ **Connector**	Shielded/Unshielded RJ-45, 8-pin jack
▪ **Impedance**	100 Ohms nominal
▪ **Signal Level Output (differential)**	0.95 to 1.05V (100Base-TX)
▪ **Signal Level Input**	350mV minimum (100Base-TX)
▪ **Supported Link Length**	100m
▪ **Cable Type (10Mbps segments)** **(100Mbps segments)** **(1000Mbps segments)**	Category 3, 4 or 5 UTP(10M) Category 5 UTP(100M) Category 5 UTP(1000M)
Multi-mode Fiber Optic Port Interface	
▪ **Connector**	SC, LC, MT-RJ or VF-45
▪ **Wavelength**	850nm
▪ **RX Input Sensitivity**	-31 dBm maximum
▪ **Output Power**	-14 dBm to -23.5 dBm (50/125μm) -14 dBm to -20 dBm (62.5/125μm)
▪ **Supported Link Length**	up to 220m full duplex
▪ **Cable Type**	50/125, 62.5/125μm F/O
Single-mode Fiber Optic Port Interface	
▪ **Connector**	SC, LC, MT-RJ, Single fiber SC
▪ **Wavelength**	1310nm SC, LC, MT-RJ 1310/1550nm Single fiber SC
▪ **RX Input Sensitivity**	-31dBm maximum
▪ **Output Power**	-8 dBm to -15 dBm (9/125μm)
▪ **Supported Link Length**	up to 50Km in full-duplex mode
▪ **Cable Type**	9/125μm F/O (recommended)

Note: Any specification is subject to change without notice.

Data Transmission / Receiving Rate and Latency at wire speed

▪ **Data Rate**	1000Mbps half duplex (Giga Ethernet)
	2000Mbps full duplex (Giga Ethernet)
	100Mbps half duplex (Fast Ethernet)
	200Mbps full duplex (Fast Ethernet)
	10Mbps half duplex (Ethernet)
	20Mbps full duplex (Ethernet)
▪ **Latency**	< 9μs (100Mbps input)
	< 59μs (10Mbps input)

Power

▪ **AC-DC Adapter Input**	100-240VAC 50/60 Hz
▪ **AC-DC Adapter Output**	5V @ 3A
▪ **RC-2201/02 Power Consumption**	RC-2201: 12.6W RC-2202: 13W

Environment

▪ **Operating Temperature**	0° to 50° C
▪ **Storage Temperature**	-20° to 70° C
▪ **Relative Humidity**	5% to 95% non-condensing
▪ **Physical Case**	Fully enclosed metal construction
▪ **Gross Weight**	0.6Kg
▪ **Vibration**	Frequency: 5-55Hz Amplitude: 0.38mm Time: 3 hours

Regulatory

▪ **Compliance**	IEEE 802.3, IEEE802.3u
▪ **Safety**	UL
▪ **Emissions**	FCC Part 15 Class A and CE Mark

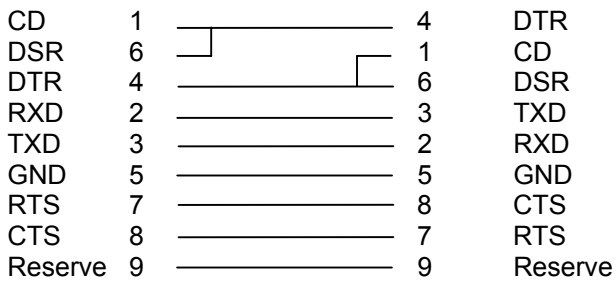
Appendix B
Null Modem Cable Specifications

The DB-9 cable is used for connecting a terminal or terminal emulator to the RC-2201/02 converter's RS-232 port to access the command-line interface.

The table below shows the pin assignments for the DB-9 cable.

Function	Mnemonic	Pin
Carrier	CD	1
Receive Data	RXD	2
Transmit Data	TXD	3
Data Terminal Ready	DTR	4
Signal Ground	GND	5
Data Set Ready	DSR	6
Request To Send	RTS	7
Clear To Send	CTS	8

9 Pin Null Modem Cable



Appendix C
MIB Specifications

The Managed Media converter supports SNMP. MIB II Enterprise MIB brief description is listed as below. A MIB file in a readable electronic media (floppy disk or CD-ROM) is packed with the product box.

```
RC2201-MIB DEFINITIONS ::= BEGIN

IMPORTS
   mib-2, DisplayString,ifIndex                          FROM RFC1213-MIB
   enterprises,Counter, TimeTicks, Gauge,IpAddress       FROM RFC1155-SMI
   OBJECT-TYPE                                           FROM RFC-1212
   TRAP-TYPE                                             FROM RFC-1215;

company          OBJECT IDENTIFIER ::= { enterprises 5205 }

mediaConverter       OBJECT IDENTIFIER ::= { company 1 }
productsShared       OBJECT IDENTIFIER ::= { company 100 }

rc2201ProductId      OBJECT IDENTIFIER ::= { mediaConverter 9 }
CommonMIB         OBJECT IDENTIFIER ::= { productsShared 1 }

commonSys         OBJECT IDENTIFIER ::= { CommonMIB 1 }

reboot OBJECT-TYPE
        SYNTAX                  INTEGER(0|1)
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "This is a reboot trigger if you set 1 to the OID.
                range (0|1)
                        0 - no effect
                        1 - reboot  "
        ::= { commonSys 1 }

timeSync OBJECT-TYPE
        SYNTAX                  TimeTicks
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "For synchronizing the system time with UTC or any source, or
getting
                it back. The expression of seconds is the same as UTC."
        ::= { commonSys 2 }
```

```
ipAssignment OBJECT-TYPE
        SYNTAX              IpAddress
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    common_sys
        DESCRIPTION
                "Get/Set the IP address of the system."
        ::= { commonSys 3 }

netMaskAssignment   OBJECT-TYPE
        SYNTAX              IpAddress
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    common_sys
        DESCRIPTION
                "Get/Set the Subnet Mask of the system."
        ::= { commonSys 4 }

defaultGW       OBJECT-TYPE
        SYNTAX              IpAddress
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    common_sys
        DESCRIPTION
                "Get/Set the default gateway of the system."
        ::= { commonSys 5 }

dns OBJECT-TYPE
        SYNTAX              IpAddress
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    common_sys
        DESCRIPTION
                "Get/Set the DNS server of the system."
        ::= { commonSys 6 }

productIDAndSN      OBJECT-TYPE
        SYNTAX              DisplayString
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    common_sys
        DESCRIPTION
                "Get the product ID and serial number that are combined by '-'
sign."
        ::= { commonSys 7 }

softwareVersion OBJECT-TYPE
        SYNTAX              DisplayString
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    common_sys
        DESCRIPTION
```

```
                "Get the software version of the system."
        ::= { commonSys 8 }

hardwareVersion         OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "Get the hardware version of the system."
        ::= { commonSys 9 }

mechanicalVersion OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "Get the mechanical version of the system."
        ::= { commonSys 10 }

biosVsersion    OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "Get the BIOS version of the system."
        ::= { commonSys 11 }

getCommunityName        OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "Get/Set the the get community name."
        ::= { commonSys 12 }

setCommunityName        OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        common_sys
        DESCRIPTION
                "Get/Set the the set community name."
        ::= { commonSys 13 }

dhcpDnsOnOff OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        common_sys
```

```
        DESCRIPTION
                "Get/Set dhcp&dns enable/disable.
                dhcp->close & dns->manual    ==> 0
                dhcp->open & dns->manual     ==> 2
                dhcp->open & dns->auto       ==> 3
                range(0|2|3)"
        ::= { commonSys 14 }
--------------------------------------------------------------------------------
fileTransfer    OBJECT IDENTIFIER ::= { CommonMIB 2 }

tftpServer      OBJECT-TYPE
        SYNTAX          IpAddress
        ACCESS      read-write
        STATUS          mandatory
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the tftp server IP address."
        ::= { fileTransfer 1 }

ftpServer           OBJECT-TYPE
        SYNTAX          IpAddress
        ACCESS      read-write
        STATUS          mandatory
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the ftp server IP address."
        ::= { fileTransfer 2 }

ftpUserName         OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS      read-write
        STATUS          mandatory
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the username that authorized by ftp server."
        ::= { fileTransfer 3 }

ftpPasswd           OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS      read-write
        STATUS          mandatory
--      @@ACTION    common_ftp
        DESCRIPTION
                "Get/set the password that authorized by ftp server."
        ::= { fileTransfer 4 }

fileTransferMethod  OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS      read-write
        STATUS          mandatory
--      @@ACTION    common_ftp
        DESCRIPTION
                "Select the File Transfer Method.
```

```
                range (1|2)
                        1 - use tftp
                        2 - use ftp."
        ::= { fileTransfer 5 }

--------------------------------------------------------------------------------
softwareUpgrade         OBJECT IDENTIFIER ::= { CommonMIB 3 }

updateImageFile         OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_soft_update
        DESCRIPTION
                "Get/set the updating image file name. Including the path."
        ::= { softwareUpgrade 1 }

doKernelImageUpgrade OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_soft_update
        DESCRIPTION
                "This is a trigger to do image update if you set to 1 to the OID.
                range (0|1)
                        0 - no effect
                        1 - do kernel image updrade."
        ::= { softwareUpgrade 2 }

kernalImageLastUpdateTime       OBJECT-TYPE
        SYNTAX                  TimeTicks
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_soft_update
        DESCRIPTION
                "Get the last kernel-image-updating time."
        ::= { softwareUpgrade 3 }

--------------------------------------------------------------------------------
configuration   OBJECT IDENTIFIER ::= { CommonMIB 4 }

noOfConfiguration       OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_config_no
        DESCRIPTION
                "The number of configuration sector."
        ::= { configuration 1 }

configurationImportTable        OBJECT-TYPE
        SYNTAX                  SEQUENCE OF ConfigurationImportEntry
        ACCESS          not-accessible
```

```
        STATUS              mandatory
        DESCRIPTION
                "A list of ConfigurationImportEntry. The number of entries is given
by
                the value of NoOfConfiguration."
        ::= { configuration 2 }


ConfigurationImportEntry ::=
SEQUENCE {
        configurationImportIndex            INTEGER,
        configurationImportFileName     DisplayString,
        doImportConfiguration   INTEGER,
        latestUpdateTime            TimeTicks
}

configurationImportEntry        OBJECT-TYPE
        SYNTAX              ConfigurationImportEntry
        ACCESS      not-accessible
        STATUS              mandatory
        DESCRIPTION
                "An entry includes the configuration import infomation that appied to
a
                particular flash sector."
        INDEX { configurationImportIndex }
        ::= { configurationImportTable 1 }

configurationImportIndex        OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    comm_config_importEntry
        DESCRIPTION
                "the index of the flash sector.
                range (1|2)
                0x01    user0 (working)
                0x02    user1"
        ::= { configurationImportEntry 1 }

configurationImportFileName     OBJECT-TYPE
        SYNTAX              DisplayString
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    comm_config_importEntry
        DESCRIPTION
                "The importing configuration file name. Include the path."
        ::= { configurationImportEntry 2 }

doImportConfiguration   OBJECT-TYPE
        SYNTAX              INTEGER(0|1)
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    comm_config_importEntry
```

```
        DESCRIPTION
                "This is a trigger to do import configuration if you set to 1 to the OID.
                 range (0|1)
                        0 - no effect
                        1 - do kernel image updrade."
        ::= { configurationImportEntry 3 }

latestUpdateTime        OBJECT-TYPE
        SYNTAX                  TimeTicks
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_config_importEntry
        DESCRIPTION
                "The configuation file last update time."
        ::= { configurationImportEntry 4 }

configurationExportTable        OBJECT-TYPE
        SYNTAX                  SEQUENCE OF ConfigurationExportEntry
        ACCESS          not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "A list of ConfigurationExportEntry. The number of entries is given
by
                the value of NoOfConfiguration."
        ::= { configuration 3 }


ConfigurationExportEntry ::=
SEQUENCE {
        configurationExportIndex                INTEGER,
        configurationExportFileName     DisplayString,
        doExportConfiguration   INTEGER
}

configurationExportEntry        OBJECT-TYPE
        SYNTAX                  ConfigurationExportEntry
        ACCESS          not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "An entry includes the configuration import infomation that appied to
a
                particular flash sector."
        INDEX { configurationExportIndex }
        ::= { configurationExportTable 1 }

configurationExportIndex        OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_config_exportEntry
        DESCRIPTION
                "the index of the flash sector.
                range (1|2)
```

```
                0x01    user0 (working)
                0x02    user1"
        ::= { configurationExportEntry 1 }

configurationExportFileName     OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_config_exportEntry
        DESCRIPTION
                "The importing configuration file name. Include the path.
                The default falue is user0, user1...etc. Depending the flash sector
index."
        ::= { configurationExportEntry 2 }

doExportConfiguration   OBJECT-TYPE
        SYNTAX                  INTEGER(0|1)
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_config_exportEntry
        DESCRIPTION
                "This is a trigger to do export configuration if you set to 1 to the OID.
                range (0|1)
                        0 - no effect
                        1 - do kernel image updrade."
        ::= { configurationExportEntry 3 }

-------------------------------------------------------------------------------
alarm   OBJECT IDENTIFIER ::= { CommonMIB 5 }

smtpServer      OBJECT-TYPE
        SYNTAX                  IpAddress
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_alarm_smtp
        DESCRIPTION
                "The SMTP Email Server IP Address."
        ::= { alarm 1 }

smtpUsername OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_alarm_smtp
        DESCRIPTION
                "The username for SMTP server."
        ::= { alarm 2 }

smtpPasswd              OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_alarm_smtp
```

```
        DESCRIPTION
                "The password for SMTP server."
        ::= { alarm 3 }

noOfEmailUsers          OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_alarm_smtp
        DESCRIPTION
                "The number of the Email Users that you want to send the alarm
notification."
        ::= { alarm 4 }

emailUserTable OBJECT-TYPE
        SYNTAX                  SEQUENCE OF EmailUserEntry
        ACCESS          not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "A list of EmailUserEntry. The number of entries is given by the
value of NoOfEmailUsers."
        ::= { alarm 5 }

EmailUserEntry ::=
SEQUENCE {
        emailUserIndex          INTEGER,
        emailAddress    DisplayString
}

emailUserEntry OBJECT-TYPE
        SYNTAX                  EmailUserEntry
        ACCESS          not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "An entry includes the user index and Email Address."
        INDEX { emailUserIndex }
        ::= { emailUserTable 1 }

emailUserIndex OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_alarm_smtpEntry
        DESCRIPTION
                "The User Index that you want to send alarming E-mail."
        ::= { emailUserEntry 1 }

emailAddress    OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_alarm_smtpEntry
        DESCRIPTION
```

```
                "The User Email Address that you want to send alarming E-mail."
        ::= { emailUserEntry 2 }

smsIspServer    OBJECT-TYPE
        SYNTAX          IpAddress
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        comm_alarm_sms
        DESCRIPTION
                "The SMS ISP Server IP Address."
        ::= { alarm 6 }

userNameForIsp          OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        comm_alarm_sms
        DESCRIPTION
                "The username for SMS server."
        ::= { alarm 7 }

passwordForIsp OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        comm_alarm_sms
        DESCRIPTION
                "The password for SMS server."
        ::= { alarm 8 }

noOfMobileUsers         OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        comm_alarm_sms
        DESCRIPTION
                "The number of the Email Users that you want to send the alarm
notification."
        ::= { alarm 9 }

mobileUserTable         OBJECT-TYPE
        SYNTAX          SEQUENCE OF MobileUserEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "A list of SmsUserEntry. The number of entries is given by the value
of NoOfMobileUsers."
        ::= { alarm 10 }

MobileUserEntry ::=
SEQUENCE {
        mobileUserIndex                 INTEGER,
        mobilePhoneNo DisplayString
```

```
}

mobileUserEntry OBJECT-TYPE
        SYNTAX          MobileUserEntry
        ACCESS      not-accessible
        STATUS          mandatory
        DESCRIPTION
                "An entry includes the user index and mobile phone number."
        INDEX { mobileUserIndex }
        ::= { mobileUserTable 1 }

mobileUserIndex         OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS      read-only
        STATUS          mandatory
--      @@ACTION    comm_alarm_smsEntry
        DESCRIPTION
                "The user's Index that you want to send alarming sms."
        ::= { mobileUserEntry 1 }

mobilePhoneNoOBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS      read-write
        STATUS          mandatory
--      @@ACTION    comm_alarm_smsEntry
        DESCRIPTION
                "The user's mobile phone number that you want to send alarming
sms."
        ::= { mobileUserEntry 2 }

-------------------------------------------------------------------------------
trap    OBJECT IDENTIFIER ::= { CommonMIB 6 }

noOfTrapHost   OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS      read-only
        STATUS          mandatory
--      @@ACTION    comm_trap_no
        DESCRIPTION
                "The number of the trap hosts."
        ::= { trap 1 }

trapHostTable   OBJECT-TYPE
        SYNTAX          SEQUENCE OF TrapHostEntry
        ACCESS      not-accessible
        STATUS          mandatory
        DESCRIPTION
                "A list of trap host entry. The number of entries is given by the value
of NoOfTrapHost."
        ::= { trap 2 }

TrapHostEntry ::=
SEQUENCE {
```

```
        trapHostIndex   INTEGER,
        trapHostIP              IpAddress,
        trapHostCommunity       DisplayString
}

trapHostEntry   OBJECT-TYPE
        SYNTAX                  TrapHostEntry
        ACCESS          not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "An entry includes the Trap Host related information."
        INDEX { trapHostIndex }
        ::= { trapHostTable 1 }

trapHostIndex   OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-only
        STATUS                  mandatory
--      @@ACTION        comm_trap_hostEntry
        DESCRIPTION
                "The index of the trap host."
        ::= { trapHostEntry 1 }

trapHostIP              OBJECT-TYPE
        SYNTAX                  IpAddress
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_trap_hostEntry
        DESCRIPTION
                "The trap host IP address."
        ::= { trapHostEntry 2 }

trapHostCommunity       OBJECT-TYPE
        SYNTAX                  DisplayString
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        comm_trap_hostEntry
        DESCRIPTION
                "The trap host community name."
        ::= { trapHostEntry 3 }


--------------------------------------------------------------------------------

rc2201Produces          OBJECT IDENTIFIER ::= { rc2201ProductId 1 }

rc2201SystemMIB                 OBJECT IDENTIFIER ::=           { rc2201Produces
1 }

rc2201Temperature OBJECT-TYPE
        SYNTAX      DisplayString
        ACCESS  read-only
        STATUS      mandatory
```

```
--          @@ACTION    sys_mib
            DESCRIPTION
                        "Read the value from the temperature sensor. It is a numerical
series
                        of 5. There is a difference of 0.5 Celsius degree between a level
and
                        its next one."
            ::= { rc2201SystemMIB 1 }

rc2201FanRPM OBJECT-TYPE
            SYNTAX      INTEGER
            ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                        "Return an approximate RPM of the fan1 on the back panel. The
value less
                        than or equal to 4200 represents that the fan is operational, else
breakdown."
            ::= { rc2201SystemMIB 2 }

rc2201DevicePort OBJECT-TYPE
            SYNTAX      DisplayString
          ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                        "Get the quantity of ports that this system owns now."
            ::= { rc2201SystemMIB 3 }

rc2201CaseIntrusion OBJECT-TYPE
            SYNTAX      DisplayString
          ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                        "Detect the Case is opened or closed."
            ::= { rc2201SystemMIB 4 }

rc2201UARTTest          OBJECT-TYPE
            SYNTAX      INTEGER(0|1)
            ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                        "UART test.
                        range (0|1)
                        1 - pass
                        0 - failure  "
            ::= { rc2201SystemMIB 5 }

rc2201DramTest          OBJECT-TYPE
            SYNTAX      INTEGER(0|1)
```

```
        ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                    "DRAM read/write test.
                    range (0|1)
                    1 - pass
                    0 - failure  "
            ::= { rc2201SystemMIB 6 }

rc2201FlashChecksumTest OBJECT-TYPE
            SYNTAX      INTEGER(0|1)
        ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                    "Flash memory read test.
                    range (0|1)
                    1 - pass
                    0 - failure  "
            ::= { rc2201SystemMIB 7 }

rc2201InternalLoopbackTest OBJECT-TYPE
            SYNTAX      DisplayString
        ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                    "Do the internal loopback test (from port 1 to port 2). "
            ::= { rc2201SystemMIB 8 }

rc2201ExternalLoopbackTest OBJECT-TYPE
            SYNTAX      DisplayString
        ACCESS  read-only
            STATUS      mandatory
--          @@ACTION    sys_mib
            DESCRIPTION
                    "Do the external loopback test (from port 1 to port 2). "
            ::= { rc2201SystemMIB 9 }

-------------------------------------------------------------------------------

rc2201PortMIB  OBJECT IDENTIFIER ::=          { rc2201Produces 2 }

rc2201NoOfPort          OBJECT-TYPE
            SYNTAX                  INTEGER
            ACCESS          read-only
            STATUS                  mandatory
--          @@ACTION    port_no
            DESCRIPTION
                    "Get the port number of the devcie. Include 7 virtual ports. (trunk
group)"
            ::= { rc2201PortMIB 1 }
```

```
rc2201PortStatusTable  OBJECT-TYPE
        SYNTAX              SEQUENCE OF RC2201PortStatusEntry
        ACCESS          not-accessible
        STATUS              mandatory
        DESCRIPTION
                "A list of RC2201PortStatusEntry. The number of entries is given by
                the value of RC2201NoOfPort. The privilege of virtual port is read-
only."
        ::= {  rc2201PortMIB 2 }

RC2201PortStatusEntry ::=
SEQUENCE {
        rc2201PortStatusIndex  INTEGER,
        rc2201PortState        INTEGER,
        rc2201PortLink         INTEGER,
        rc2201PortNegotiation  INTEGER,
        rc2201PortSpeed            INTEGER,
        rc2201PortDuplex       INTEGER,
        rc2201PortFlwCtl       INTEGER
}

rc2201PortStatusEntry  OBJECT-TYPE
        SYNTAX              RC2201PortStatusEntry
        ACCESS          not-accessible
        STATUS              mandatory
        DESCRIPTION
                "An entry includes the port status releated infomation."
        INDEX { rc2201PortStatusIndex }
        ::= { rc2201PortStatusTable 1 }

rc2201PortStatusIndex  OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS          read-only
        STATUS              mandatory
--      @@ACTION        portEntry
        DESCRIPTION
                "The index of the port."
        ::= { rc2201PortStatusEntry 1 }

rc2201PortStateOBJECT-TYPE
        SYNTAX              INTEGER(0|1)
        ACCESS          read-write
        STATUS              mandatory
--      @@ACTION        portEntry
        DESCRIPTION
                "Get/Set the on/off state of the designated port.
                Port state of virtual is on if the trunk group is enabled.
                range (0|1)
                0 - Off
                1 - On  "
        ::= { rc2201PortStatusEntry 2 }
```

```
rc2201PortLink  OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get the link state of the designated port.
                Link state of virtual port is up if one of group members is link up.
                range (0|1)
                0 - Down
                1 - Up  "
        ::= { rc2201PortStatusEntry 3 }

rc2201PortNegotiation   OBJECT-TYPE
        SYNTAX          INTEGER(0|1)
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get/Set the negotiation setting of the designated port.
                Virtual port is always in auto mode.
                range (0|1)
                0 - Force
                1 - Auto "
        ::= { rc2201PortStatusEntry 4 }

rc2201PortSpeed         OBJECT-TYPE
        SYNTAX          INTEGER(0|1|2)
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get/Set the speed mode of the designated port.
                range (0|1|2)
                0 - 10Mb
                1 - 100Mb
                2 - 1Gb (only for port 1, 2)
                Access mode of virtual port is read-only.
                The unit of virtual port is megabyte (MB)"
        ::= { rc2201PortStatusEntry 5 }

rc2201PortDuplex        OBJECT-TYPE
        SYNTAX          INTEGER(0|1)
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get/Set the duplex mode of the designated port.
                Virtual port is always in full duplex mode.
                range (0|1)
                0 - Half
                1 - Full"
        ::= { rc2201PortStatusEntry 6 }
```

```
rc2201PortFlwCtl        OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        portEntry
        DESCRIPTION
                "Get/Set the Flow Control mode of the designated port. In the half
duplex mode,
                the flow control state always BackPressure. State of virtual port is
always enabled.
                range(0|1|2|3)
                Get:
                0 - Disable, 1 - Enable  ,2 - TX pauss, 3 - RX pause
                Set:
                0 - Disable, 1 - Symmetric, 2 - Asymmetric, 3 - BackPressure(for
half duplex mode only)."
        ::= { rc2201PortStatusEntry 7 }

rc2201PortCounterTable          OBJECT-TYPE
        SYNTAX                  SEQUENCE OF RC2201PortCounterEntry
        ACCESS                  not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "A list of RC2201PortCounterEntry. The number of entries is given
by
                the value of RC2201NoOfPort. The privilege of virtual port is read-
only."
        ::= { rc2201PortMIB 3 }

RC2201PortCounterEntry ::=
SEQUENCE {
        rc2201PortTxGoodPkts  Counter,
        rc2201PortTxBadPkts   Counter,
        rc2201PortRxGoodPkts Counter,
        rc2201PortRxBadPkts   Counter,
        rc2201PortTxGoodBytes           Counter,
        rc2201PortRxGoodBytes           Counter,
        rc2201PortTxAborts      Counter,
        rc2201PortTxCollisions  Counter,
        rc2201PortDropPkts      Counter
}

rc2201PortCounterEntryOBJECT-TYPE
        SYNTAX                  RC2201PortCounterEntry
        ACCESS          not-accessible
        STATUS                  mandatory
        DESCRIPTION
                "An entry includes the partulicular port counter infomation."
        INDEX { rc2201PortTxGoodPkts }
        ::= { rc2201PortCounterTable 1 }

rc2201PortTxGoodPkts  OBJECT-TYPE
```

```
        SYNTAX              Counter
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get the current counter of total Tx good packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 1 }

rc2201PortTxBadPkts   OBJECT-TYPE
        SYNTAX              Counter
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get the current counter of total Tx bad packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 2 }

rc2201PortRxGoodPkts OBJECT-TYPE
        SYNTAX              Counter
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get the current counter of total Rx good packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 3 }

rc2201PortRxBadPkts   OBJECT-TYPE
        SYNTAX              Counter
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get the current counter of total Rx bad packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 4 }

rc2201PortTxGoodBytes         OBJECT-TYPE
        SYNTAX              Counter
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    portEntry
        DESCRIPTION
                "Get the current counter of total bytes within Tx good packets on
the designated
                port since system boot-up."
        ::= { rc2201PortCounterEntry 5 }
```

```
rc2201PortRxGoodBytes          OBJECT-TYPE
        SYNTAX                 Counter
        ACCESS         read-only
        STATUS                 mandatory
--      @@ACTION       portEntry
        DESCRIPTION
                "Get the current counter of total bytes within Rx good packets on
the designated
                port since system boot-up."
        ::= { rc2201PortCounterEntry 6 }

rc2201PortTxAborts     OBJECT-TYPE
        SYNTAX                 Counter
        ACCESS         read-only
        STATUS                 mandatory
--      @@ACTION       portEntry
        DESCRIPTION
                "Get the current counter of total error packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 7 }

rc2201PortTxCollisions  OBJECT-TYPE
        SYNTAX                 Counter
        ACCESS         read-only
        STATUS                 mandatory
--      @@ACTION       portEntry
        DESCRIPTION
                "Get the current counter of total collision packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 8 }

rc2201PortDropPkts     OBJECT-TYPE
        SYNTAX                 Counter
        ACCESS         read-only
        STATUS                 mandatory
--      @@ACTION       portEntry
        DESCRIPTION
                "Get the current counter of total drop packets on the designated
port since
                system boot-up."
        ::= { rc2201PortCounterEntry 9 }


rc2201PopularFuncMIB OBJECT IDENTIFIER ::= { rc2201Produces 3}

rc2201NTPTimeServer  OBJECT-TYPE
        SYNTAX         DisplayString
        ACCESS         read-write
        STATUS         mandatory
--      @@ACTION       popular_func
```

```
        DESCRIPTION
                "Get/Set the NTP Time Server IP. "
        ::= { rc2201PopularFuncMIB 1}

rc2201NTPTimeZone    OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set the NTP Time Zone.
                value range is between 1 and 26
                 1 - GMT -12:00,
                 2 - GMT -11:00,
                 3 - GMT -10:00,
                 4 - GMT -09:00,
                 5 - GMT -08:00,
                 6 - GMT -07:00,
                 7 - GMT -06:00,
                 8 - GMT -05:00,
                 9 - GMT -04:00,
                10 - GMT -03:00,
                11 - GMT -02:00,
                12 - GMT -01:00,
                13 - GMT +00:00,
                14 - GMT +01:00,
                15 - GMT +02:00,
                16 - GMT +03:00,
                17 - GMT +04:00,
                18 - GMT +05:00,
                19 - GMT +06:00,
                20 - GMT +07:00,
                21 - GMT +08:00,
                22 - GMT +09:00,
                23 - GMT +10:00,
                24 - GMT +11:00,
                25 - GMT +12:00,
                26 - GMT +13:00. "
        ::= { rc2201PopularFuncMIB 2}

rc2201DayLightSavingTime      OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set the daylight saveing time.
                value range is between 1 and 11. unit: hour
                 1 - -5,
                 2 - -4,
                 3 - -3,
                 4 - -2,
                 5 - -1,
```

```
                    6 - 0,
                    7 - 1,
                    8 - 2,
                    9 - 3,
                   10 - 4,
                   11 - 5 "
        ::= { rc2201PopularFuncMIB 3}

rc2201DayLightStartTime         OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Set the Start time of DayLight
                example: month/day/hour   10/01/00
                month: 01~12, day: 01~31, hour: 00~23 ."
        ::= { rc2201PopularFuncMIB 4}

rc2201DayLightEndTime           OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Set the End time of DayLight
                example: month/day/hour   04/01/00
                month: 01~12, day: 01~31, hour: 00~23 ."
        ::= { rc2201PopularFuncMIB 5}

rc2201NTPTimeSync       OBJECT-TYPE
        SYNTAX                  INTEGER(0|1)
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Sync time from NTP Server. The return value is always 0.
                Setting the Time Server and TimeZone before doing time sync.
                value range (1|0):
                1 - sync,
                0 - don't sync time from NTP. "
        ::= { rc2201PopularFuncMIB 6}

rc2201MaxPacketLength           OBJECT-TYPE
        SYNTAX                  INTEGER(0|1)
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set the Maximun Packet Length (1522/1536 bytes).
                value range (1|0)
                1 - 1536 bytes,
                0 - 1522 bytes "
```

```
        ::= { rc2201PopularFuncMIB 7}

rc2201BrocastSupress  OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS        read-write
        STATUS              mandatory
--      @@ACTION    popular_func
        DESCRIPTION
                "Get/Set the Brocast Suppression Status.
                value range (0 - 30)
                0 : disabled,
                1 - 30 : enabled and the setting time (sec). "
        ::= { rc2201PopularFuncMIB 8}

rc2201BrocastStormFiltering     OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS        read-write
        STATUS              mandatory
--      @@ACTION    popular_func
DESCRIPTION
                "Get/Set Brocast Storm Filtering Mode.
                range (0-5)
                0 - don't filter brocast,
                1 - filter brocast packet if the brocast packets in the buffer is over
5%,
                2 - filter brocast packet if the brocast packets in the buffer is over
10%,
                3 - filter brocast packet if the brocast packets in the buffer is over
15%,
                4 - filter brocast packet if the brocast packets in the buffer is over
20%,
                5 - filter brocast packet if the brocast packets in the buffer is over
25% . "
        ::= { rc2201PopularFuncMIB 9}

rc2201PrioriyQueueService       OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS        read-write
        STATUS              mandatory
--      @@ACTION    popular_func
        DESCRIPTION
                "Get/Set Priority Queue Method.
                 value range (0|1|2)
                 0 - first come first service,
                 1 - all high before low,
                 2 - weight round robin.  "
        ::= { rc2201PopularFuncMIB 10}

rc2201HighWeight        OBJECT-TYPE
        SYNTAX        INTEGER
        ACCESS        read-write
        STATUS        mandatory
--      @@ACTION    popular_func
```

```
        DESCRIPTION
                "Get/Set high weight value (co-operated with low weight).
                This function is only for weight round robin. Always return 0 if the
operaion of
                priority queue service isn't WRR.
                The value of high weight must be higher than the value of low
weight.
                value range (1 - 7). "
        ::= { rc2201PopularFuncMIB 11}

rc2201LowWeight         OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set low weight value (co-operated with high weight).
                This function is only for weight round robin.
                value range (1 - 7). "
        ::= { rc2201PopularFuncMIB 12}

rc2201QoSPrioriyLevelSeting     OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set the High Priority level. The value is a mask.
                bit0 means level 0, bit1 means level 1, ..., and so on.
                range ( 0 - 128)"
        ::= { rc2201PopularFuncMIB 13}

rc2201MaxBridgeTransmitDelayBound   OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set the Maximun Bridge Transmit Delay Bnd.
                value ragne (0|1|2|3)
                0 - 1 sec,
                1 - 2 secs,
                2 - 4 secs,
                3 - Off"
        ::= { rc2201PopularFuncMIB 14}

rc2201MaxDelayTime      OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        popular_func
        DESCRIPTION
                "Get/Set the Maximun Delay Bound.
```

```
                We must enable the max bridge transmit delay bound before
ebabling the max delay time.
                value range (0-255)
                0 - disable delay bound
                1 - delay 1 ms,
                2 - delay 2 ms,
                3 - delay 3 ms,
                ... and so on."
        ::= { rc2201PopularFuncMIB 15}

rc2201PowerDownSetting      OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    popular_func
        DESCRIPTION
                "Get/Set the Power Down automatically when the fan stopped,
                and temperature is over 60 degrees"
        ::= { rc2201PopularFuncMIB 16 }

-- Auto Ping Function

rc2201AutoPingMIB   OBJECT IDENTIFIER ::=       { rc2201Produces 5 }

rc2201AutoPingInterval OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS      read-write
        STATUS              mandatory
--      @@ACTION    AutoPing
        DESCRIPTION
                "Get/Set the auto ping time inteval. (mins).
                value range (1 - 60)"
        ::= { rc2201AutoPingMIB 1 }

rc2201AutoPingGroupNo       OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS      read-only
        STATUS              mandatory
--      @@ACTION    AutoPing
        DESCRIPTION
                "Get the amount of auto ping group."
        ::= { rc2201AutoPingMIB 2 }

rc2201AutoPingTable OBJECT-TYPE
        SYNTAX              SEQUENCE OF RC2201AutoPingEntry
        ACCESS      not-accessible
        STATUS              mandatory
        DESCRIPTION
                "A list of Autoping function entries. The number of entries is given
by the
                value of the RC2201AutoPingGroupNo. "
        ::= { rc2201AutoPingMIB 3 }
```

```
RC2201AutoPingEntry ::=
SEQUENCE {
        rc2201AutoPingIndex    INTEGER,
        rc2201AutoPingDestIp   IpAddress
}

rc2201AutoPingEntry    OBJECT-TYPE
        SYNTAX              RC2201AutoPingEntry
        ACCESS         not-accessible
        STATUS              mandatory
        DESCRIPTION
                "An entry includes the Autoping releated infomation."
        INDEX { rc2201AutoPingIndex }
        ::= { rc2201AutoPingTable 1 }

rc2201AutoPingIndex    OBJECT-TYPE
        SYNTAX              INTEGER
        ACCESS         read-only
        STATUS              mandatory
--      @@ACTION       AutoPing_Entry
        DESCRIPTION
                "Get the index of AutoPing."
        ::= { rc2201AutoPingEntry 1 }

rc2201AutoPingDestIp   OBJECT-TYPE
        SYNTAX              IpAddress
        ACCESS         read-write
        STATUS              mandatory
--      @@ACTION       AutoPing_Entry
        DESCRIPTION
                "Get/Set the IP Address of destination of AutoPing ."
        ::= { rc2201AutoPingEntry 2 }

-- Trap Event Configuration Function
-----------------------------------------------------------------
rc2201TrapEventConfMIB         OBJECT IDENTIFIER ::= { rc2201Produces 6 }

rc2201ColdStartConf    OBJECT-TYPE
        SYNTAX         INTEGER
        ACCESS         read-write
        STATUS         mandatory
--      @@ACTION       trapconf_mib
        DESCRIPTION
                "Get/Set the cold-start status of E-mail, SMS and trap configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 1 }

rc2201WarmStartConf    OBJECT-TYPE
```

```
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the warm-start status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 2 }

rc2201LinkDownConf      OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
               "Get/Set the link-down status of E-mail, SMS and trap configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 3 }

rc2201LinkUpConf        OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the link-up status of E-mail, SMS and trap configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 4 }

rc2201AuthFailConf      OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the auth-fail status of E-mail, SMS and trap configuration.
                We use a 3-bit mask to present the status.
```

```
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 5 }

rc2201StpTopoChangedConf     OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the StpTopoChanged status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 6 }

rc2201StpDisabledConf OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the StpDisabled status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 7 }

rc2201StpEnabledConf  OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-write
        STATUS                  mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the StpEnabled status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
```

```
        ::= { rc2201TrapEventConfMIB 8 }

rc2201TemperatureAbnormalConf       OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the TemperatureAbnormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 9 }

rc2201TemperatureNormalConf OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the TemperatureNormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 10 }

rc2201FlashWriteErrorConf       OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the FlashWriteError status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 11 }

rc2201FanAbnormalConf       OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
```

```
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the FanAbnormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 12 }

rc2201FanNormalConf  OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the FanNormal status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 13 }

rc2201CaseClosedConf OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the CaseClosed status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 14 }

rc2201CaseOpenedConf        OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-write
        STATUS          mandatory
--      @@ACTION        trapconf_mib
        DESCRIPTION
                "Get/Set the CaseOpened status of E-mail, SMS and trap
configuration.
```

```
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 15 }

rc2201FandonAndHighTemperatureConf          OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS                  read-write
        STATUS                  mandatory
--      @@ACTION                trapconf_mib
        DESCRIPTION
                "Get/Set the fan/temperature fail status of E-mail, SMS and trap
configuration.
                We use a 3-bit mask to present the status.
                bit0 means Email State, bit1 means SMS state and  bit2 means trap
state.
                If you want to send the E-mail alarm and trap, set the oid value with
5.
                value range (1 - 7)."
        ::= { rc2201TrapEventConfMIB 16 }

-- Log Table Function ----

rc2201LogDataMIB        OBJECT IDENTIFIER ::= { rc2201Produces 7 }

rc2201TrapLogNo         OBJECT-TYPE
        SYNTAX                  INTEGER
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        traplog_no
        DESCRIPTION
                "Get the current number of trap log. "
        ::= { rc2201LogDataMIB 1 }

rc2201TrapLogTable      OBJECT-TYPE
        SYNTAX          SEQUENCE OF RC2201TrapLogEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "A list of trap log information. The number of entries is given by the
                value of the RC2201TrapLogNo. "
        ::= { rc2201LogDataMIB 2 }

RC2201TrapLogEntry ::=
SEQUENCE {
        rc2201TrapLogEvent      DisplayString
}

rc2201TrapLogEntry OBJECT-TYPE
        SYNTAX          RC2201TrapLogEntry
```

```
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "An entry containing information for trap logs."
        INDEX { rc2201TrapLogEvent }
        ::= { rc2201TrapLogTable 1}

rc2201TrapLogEvent OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        traplog_mibEntry
        DESCRIPTION
                "Get the trap log information in the device. The output format is
'Trap Time ; Trap Event'
                Ex: 'Thu Oct 09 11:27:30 2003 ; Cold Start '. "
        ::= { rc2201TrapLogEntry 1}

rc2201IllegalAccessEventNo      OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        illAccess_no
        DESCRIPTION
                "Get the total number of illegal access events. "
        ::= { rc2201LogDataMIB 3 }

rc2201IllegalAccessTable        OBJECT-TYPE
        SYNTAX                  SEQUENCE OF RC2201IllegalAccessEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "A list of illegal access information. The number of entries is given
by the
                value of the RC2201IllegalAccessEventNo. "
        ::= { rc2201LogDataMIB 4 }

RC2201IllegalAccessEntry ::=
SEQUENCE {
        rc2201IllegalAccessEvent        DisplayString
}

rc2201IllegalAccessEntry        OBJECT-TYPE
        SYNTAX          RC2201IllegalAccessEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "An entry containing information for illegal access log. "
        INDEX { rc2201IllegalAccessEvent }
        ::= { rc2201IllegalAccessTable 1}

rc2201IllegalAccessEvent OBJECT-TYPE
        SYNTAX          DisplayString
```

```
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        aceslog_Entry
        DESCRIPTION
                "Get the illegal access event informaion. The output format is
'SA;DA;Port No;Time;Reason'
                The MAC SA and DA could be replaced by alias name if you set the
MAC alias.
                There are two kinds of violate types:
                        VAT - Violating Allowed Table
                        VDT - Violating Denied Table
                Ex: 'SA[00-02-b3-b1-01-b9];DA[Note];Port[1];Time[Thu Oct 09
11:27:30 2003];Reason[VAT] '. "
        ::= { rc2201IllegalAccessEntry 1}

rc2201MACAliasNo        OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        macAllias_no
        DESCRIPTION
                "Get the total number of current alias entry. The maximum number
is 20. "
        ::= { rc2201LogDataMIB 5 }

rc2201MACAliasTable     OBJECT-TYPE
        SYNTAX                  SEQUENCE OF RC2201MACAliasEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "A list of MAC Alias information. The number of entries is given by
the
                value of the RC2201MACAliasNo. "
        ::= { rc2201LogDataMIB 6 }

RC2201MACAliasEntry ::=
SEQUENCE {
        rc2201MACAliasIndex     INTEGER,
        rc2201MACAliasMAC       OCTET STRING,
        rc2201MACAliasName      DisplayString
}

rc2201MACAliasEntry     OBJECT-TYPE
        SYNTAX          RC2201MACAliasEntry
        ACCESS          not-accessible
        STATUS          mandatory
        DESCRIPTION
                "An entry containing information for MAC Alias. "
        INDEX { rc2201MACAliasIndex }
        ::= { rc2201MACAliasTable 1}

rc2201MACAliasIndex OBJECT-TYPE
        SYNTAX          INTEGER
```

```
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        macAllias_Entry
        DESCRIPTION
                "Get the index of the MAC alias entry. "
        ::= { rc2201MACAliasEntry 1}

rc2201MACAliasMAC OBJECT-TYPE
        SYNTAX          OCTET STRING
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        macAllias_Entry
        DESCRIPTION
                "Get the mac address of the mac alias MAC. "
        ::= { rc2201MACAliasEntry 2}

rc2201MACAliasName OBJECT-TYPE
        SYNTAX          DisplayString
        ACCESS          read-only
        STATUS          mandatory
--      @@ACTION        macAllias_Entry
        DESCRIPTION
                "Get the mac address of the mac alias Name. "
        ::= { rc2201MACAliasEntry 3}

-------------------------------------------------------------------------------
rc2201TrapEntry                 OBJECT IDENTIFIER ::= { rc2201Produces 20 }

temperature OBJECT-TYPE
      SYNTAX     OCTET STRING
         ACCESS  not-accessible
         STATUS     mandatory
         DESCRIPTION
        "Read the value from the temperature sensor. The range is
        from -27.5 Celsius degree to 100 Celsius degree. "
        ::= { rc2201TrapEntry 1 }

fanRPM OBJECT-TYPE
        SYNTAX  INTEGER
        ACCESS  not-accessible
        STATUS     mandatory
        DESCRIPTION
       "Read RPM of the Fan. The range is from 0 to 4200. "
        ::= { rc2201TrapEntry 2 }

voltage OBJECT-TYPE
      SYNTAX     OCTET STRING
         ACCESS  not-accessible
         STATUS     mandatory
         DESCRIPTION
           "The voltage of the power. the range is from 3.9V to 6.1V. "
        ::= { rc2201TrapEntry 3 }
```

```
lacpGroupId OBJECT-TYPE
      SYNTAX     INTEGER
          ACCESS  not-accessible
          STATUS     mandatory
          DESCRIPTION
             "The Trunk group ID of LACP. "
          ::= { rc2201TrapEntry 4 }

groupId OBJECT-TYPE
      SYNTAX     INTEGER
          ACCESS  not-accessible
          STATUS     mandatory
          DESCRIPTION
             "The group ID of Fail-Over. "
          ::= { rc2201TrapEntry 5 }

fanNo OBJECT-TYPE
          SYNTAX INTEGER
          ACCESS not-accessible
          STATUS          mandatory
          DESCRIPTION
                  "The Fan Number."
          ::= { rc2201TrapEntry 6 }

bandwidth OBJECT-TYPE
          SYNTAX DisplayString
          ACCESS not-accessible
          STATUS          mandatory
          DESCRIPTION
                  "The bandwidth of some port."
          ::= { rc2201TrapEntry 7 }

rc2201TemperatureOver  TRAP-TYPE
          ENTERPRISE rc2201ProductId
          VARIABLES   { temperature }
          DESCRIPTION
         "Send this trap when the temperature of the power is over 55 Celsius
degree.
         The OID value means the temperature of the system. "
          ::= 1

rc2201TemperatureNormal  TRAP-TYPE
          ENTERPRISE rc2201ProductId
          VARIABLES   { temperature }
          DESCRIPTION
         "Send this trap when the temperature of the power is under 53 Celsius
degree from a
          previous RC2201TemperatureOver Status or the temperature is upper 6
Celsius degree
          from the previous RC2201TemperatureUnder Status. The OID value means
the temperature
          of the system. "
          ::= 2
```

```
rc2201FanAbnormal  TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { fanNo, fanRPM }
        DESCRIPTION
           "Send this trap when the RPM of Fan is under 2800. The OID value
means the RPM of Fan
           and the fan number."
        ::= 3

rc2201FanNormal    TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { fanNo, fanRPM }
        DESCRIPTION
           "Send this trap when the RPM of Fan is over 2800 from a previous
RC2201FanDown Status.
            The OID vaule means the RPM of fan and the fan number. "
        ::= 4

rc2201VdcOver  TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { voltage }
        DESCRIPTION
           "Send this trap when the voltage is over 5.5V. The OID value means
            the voltage of system. "
        ::= 5

rc2201VdcUnder  TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { voltage }
        DESCRIPTION
           "Send this trap when the voltage is under 4.5V. The OID value means
            the voltage of system. "
        ::= 6

rc2201VdcNormal  TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { voltage }
        DESCRIPTION
           "Send this trap when the voltage is during 4.5V and 5.5V from a previous
            RC2201VDCOver of RC2201VDCUnder status. The OID value means
the voltage of system. "
        ::= 8

rc2201ModuleRemoved TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { ifIndex }
        DESCRIPTION
           "Send this trap when a moudule is removed from the system. The OID
value means
            the port number."
        ::= 9
```

```
rc2201ModuleInserted TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { ifIndex }
        DESCRIPTION
           "Send this trap when a moudle is inserted to the system. The OID value
means
            the port number."
        ::= 10

rc2201CaseOpened TRAP-TYPE
        ENTERPRISE  rc2201ProductId
        DESCRIPTION
           "Send this trap when the case is opened. "
        ::= 13

rc2201CaseClosed TRAP-TYPE
        ENTERPRISE  rc2201ProductId
        DESCRIPTION
           "Send this trap when the case is closed from a previous
RC2201CaseOpen status. "
        ::= 14

rc2201FlashWriteFailure TRAP-TYPE
        ENTERPRISE  rc2201ProductId
        DESCRIPTION
           "Send this trap when a flash write failed happen. "
        ::= 17

rc2201TemperatureOverHeat  TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { temperature }
        DESCRIPTION
       "Send this trap when the temperature of the power is over 70 Celsius
degree.
       The OID value means the temperature of the system. "
        ::= 19

rc2201TemperatureUnder  TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { temperature }
        DESCRIPTION
       "Send this trap when the temperature of the power is under 4 Celsius
degree.
       The OID value means the temperature of the system. "
        ::= 20

rc2201FanDownAndHighTemp TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the temperature of device is over 60 Celsius
degree and
                the fan is down."
        ::= 21
```

```
rc2201PowerDown TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the battery power of device is down."
        ::= 22

rc2201BatteryInvalid TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the battery of device is invalid."
        ::= 23

rc2201BatteryNotExist TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the battery of device is not exist."
        ::= 24

rc2201PowerRecovered TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the battery power of device has recovered."
        ::= 25

rc2201BatteryRecovered TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the battery of device has recovered."
        ::= 26

rc2201BatteryExist TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
                "Send this trap when the battery of device has existed."
        ::= 27

rc2201StpStateDisabled TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of STP is from enabled to
disabled. "
        ::= 100

rc2201StpStateEnabled TRAP-TYPE
        ENTERPRISE rc2201ProductId
        DESCRIPTION
          "Send this trap when the operational state of STP is from disabled to
enabled. "
        ::= 101

rc2201StpTopologyChanged TRAP-TYPE
        ENTERPRISE rc2201ProductId
```

```
        VARIABLES   { ifIndex }
        DESCRIPTION
          "Send this trap when RSTP determines a port should enter the
FORWARDING state
           (a topology change occurs). The OID value is the ifIndex of the port that
           produces the topology change"
        ::= 102

rc2201LacpStateDisabled TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { lacpGroupId }
        DESCRIPTION
          "Send this trap when the operational state of LACP is from enabled to
disabled.
           The OID value means the enabled Group ID. "
        ::= 120

rc2201LacpStateEnabled TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { lacpGroupId }
        DESCRIPTION
          "Send this trap when the operational state of LACP is from disabled to
enabled.
           The OID value means the disabled Group ID."
        ::= 121

rc2201LacpPortRemoved TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { lacpGroupId, ifIndex }
        DESCRIPTION
          "Send this trap when one port is removed from one group (ex :The port
link of one trunk
           gruop is down). This trap takes two OID value, one is the trunk group ID ,
another is
           the removed port number. "
        ::= 122

rc2201LacpPortAdded TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { lacpGroupId, ifIndex }
        DESCRIPTION
          "Send this trap when one port is added from one group (ex :The port link
of one trunk
           gruop is up). This trap takes two OID value, one is the trunk group ID ,
another is
           the removed port number. "
        ::= 123

rc2201FailOverStateDisabled TRAP-TYPE
        ENTERPRISE rc2201ProductId
        VARIABLES   { groupId }
        DESCRIPTION
          "Send this trap when the operational state of Fail-Over is from enabled to
```

```
disabled.
            The OID value means the disabled group ID. "
          ::= 130

rc2201FailOverStateEnabled TRAP-TYPE
          ENTERPRISE rc2201ProductId
          VARIABLES   { groupId }
          DESCRIPTION
            "Send this trap when the operational state of Fail-Over is from disabled to
enabled.
            The OID value means the enabled group ID. "
          ::= 131

rc2201FailoverFailure TRAP-TYPE
          ENTERPRISE rc2201ProductId
          VARIABLES   { groupId }
          DESCRIPTION
            "Send this trap when the state of a active port in one Fail-Over group is
down, and
            the passive port link isn't up.The OID value means the group ID. "
          ::= 133

rc2201GvrpStateDisabled TRAP-TYPE
          ENTERPRISE rc2201ProductId
          DESCRIPTION
            "Send this trap when the operational state of GVRP is from enabled to
disabled. "
          ::= 140

rc2201GvrpStateEnabled TRAP-TYPE
          ENTERPRISE rc2201ProductId
          DESCRIPTION
            "Send this trap when the operational state of LACP is from disabled to
enabled. "
          ::= 141

rc2201VlanStateDisabled TRAP-TYPE
          ENTERPRISE rc2201ProductId
          DESCRIPTION
            "Send this trap when the operational state of vlan is from enabled to
disabled.
            The OID value means the enabled Group ID. "
          ::= 150

rc2201VlanTagBaseEnabled TRAP-TYPE
          ENTERPRISE rc2201ProductId
          DESCRIPTION
            "Send this trap when the operational state of vlan is changed to tag-based
vlan. "
          ::= 152

END
```

Appendix D
Software Upgrade Procedures

If the RC-2201/02 has not been installed yet, please follow the steps below to upgrade software:

Setup of the Environment:

1. Set PC's Ethernet Port IP Address as 192.168.1.176 (RC-2201/02 TFTP Server Default Value=192.168.1.176)
2. Copy the file of the new version to the path specified by TFTP Server (e.g. C:\)
3. Run TFTP Server program (TFTPD32.EXE) on PC with the following parameter settings:
4. Run Hyper Terminal (hypertrm.exe) on PC (Windows 2000 Operating System is recommended), and set up the parameters of COM Port as follows:

Baud Rate	: 57600
Stop bits	: 1
Data bits	: 8
Parity	: N
Flow control	: none

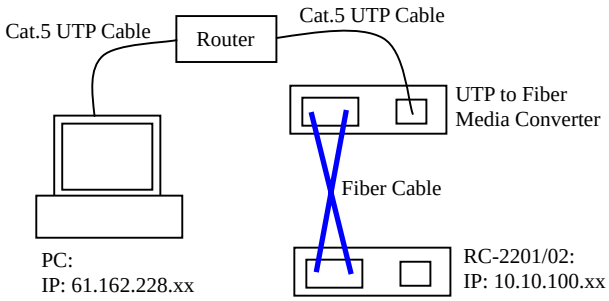
Upgrade Steps:

1. Use Null Modem Cable(shipped with RC-2201/02) to connect RC-2201/02 and RS-232 port of PC.
2. Use Cat.5 UTP Cable to connect RC-2201/02 and Ethernet UTP Port of PC.
3. Turn RC-2201/02's power on.
4. The login message will be displayed on the screen of terminal emulator after starting up the system, and then user can login the management system with the default username and password below:
   Username: admin
   Password: admin
5. Choose Software Upgrade function to ensure that whether TFTP Server address, image filename and path are correct or not.
6. Choose **<Upgrade>** button to download the software. According to the message shown by TFTP Server, user can see that if the download of the file is completed successfully.
7. After completing the download, the file will be saved into the flash memory only when this file is valid.
8. Do not reboot RC-2201/02 or turn its power off before the upgrade is completed.
9. Successful message will be shown after the upgrade is completed and then choose Reboot System function to re-login the management system.
10. Choose System Information function to confirm that if the version of firmware had been upgraded to the new one.
11. Repeat 1 – 10 steps, as needed, to upgrade the next set of RC-2201/02.

If the RC-2201/02 had been installed on remote site, please follow the steps below to upgrade software:

Setup of the Environment:

1. Set PC's Ethernet Port IP Address based on the configuration of central site, e.g. 61.162.228.xx (RC-2201/02 TFTP Server Default Value=192.168.1.176)
2. Copy the file of the new version to the path specified by TFTP Server (e.g. C:\)
3. Run TFTP Server program (TFTPD32.EXE) on PC



4. Use Cat.5 UTP Cable to connect the router and Ethernet UTP Port of PC

Upgrade Steps:

1. Run telnet on PC (Windows 2000 Operating System is recommended) as follows:

   Telnet 10.10.100.xx

   Login message will be displayed on the screen, and then user can login the management system with the following username and password:

   Username: admin
   Password: admin

2. Choose Software Upgrade function to ensure that whether TFTP Server address, image filename and path are correct or not.
3. Choose **<Upgrade>** button to download the software. According to the message shown by TFTP Server, user can see that if the download of the file is completed successfully.
4. After completing the download, the file will be saved into the flash memory only when this file is valid.
5. Do not reboot RC-2201/02 or turn its power off before the upgrade is completed.
6. Successful message will be shown after the upgrade is completed and then choose Reboot System function.
7. Telnet again to login the management system.
8. Choose System Information function to confirm that if the version of firmware had been upgraded to the new one.
9. Repeat 1 – 8 steps, as needed, to upgrade the next set of RC-2201/02.